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ABSTRACT

This sourcebook and report describes the results of the Alternative Teacher Preparation Institute for Secondary Foreign Language, Mathematics, and Science Teachers at Georgia State University, and offers a plan to implement an alternative graduate level teacher preparation program, the Teacher Education Environments in Mathematics and Science (TEEMS) project. The underlying framework for the new program is based on reflective and constructivist models of learning; it will be planned holistically by college professors, secondary classroom teachers, and supervisors. The TEEMS project is designed to prepare a new cadre of mathematics and science teachers for Georgia's middle and secondary schools. Materials in the sourcebook are organized into the following sections: (1) The Alternative Teacher Preparation Proposal; (2) The Alternative Teacher Preparation Curriculum; (3) The Nature of Alternative Teacher Preparation; (4) Status and Perceptions of Alternatively Prepared Teachers; (5) Attitudes of Alternatively Prepared Teachers; (6) Concerns of Alternatively Prepared Teachers; (7) The TEEMS proposal; and (8) the TEEMS Curriculum. An appendix provides recruitment brochures, application forms, and evaluation forms used in the Alternative Teacher Preparation Program. (LL)

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The TEEMS Project

A Report on Alternative Teacher Preparation of Secondary Teachers

Project Sourcebook

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Contents

Section 1. Overview 1

Purpose of this Sourcebook 3
The GSU Alternative Teacher Preparation Program 3
TEEMS 5
Highlights 6
A Look Ahead 8

Section 2. The Alternative Teacher Preparation Proposal 11

Abstract 14
Goals and Philosophy of the Alternative Teacher Preparation Institute 15
Curriculum and Instructional Design 19
Instructional Delivery System 33
Selection and Admission of Interns and Mentors 37
Record Keeping 40
Administrative and Management System 41
Evaluation and Research 44

Section 3 An Alternative Teacher Preparation Curriculum 47

Alternative Teacher Preparation Curriculum Model 49
Holistic Summer Institute Schedule (Sample) 50
Course Syllabi and Instructional Plans 57
Clinical Teaching 58
Reflective Teaching, Microteaching, Instruction and Microcomputers 65
Course in Science Teaching: The Olympia Edition (Student's Version) 74
Course in Science Teaching: The Olympia Edition (Instructor's Version) 87
Methods and Materials for Teaching Secondary Mathematics 121
Human Growth and Development 127
Special Education 129

Internship Program Action Plan 134

Section 4. On Alternative Teacher Preparation 149

Characteristics of Alternative Certification Programs 153
Alternative Certification in Georgia 156
The GSU Alternative Certification Program 158
Program Effectiveness 168
The Future of Alternative Certification 171
Bibliography 174

Section 5. Status and Perceptions of Alternatively Prepared Teachers 177

History of Alternative Teacher Preparation 181
Purpose of This Report 182
The Participants 182
Current Status 183
Where do they teach? 183
Classes taught? 184
Average class size? 185
Non-teaching duties? 186
Socio-economic status? 186
Staff development? 187
Future plans? 188
Perceptions of the Teacher Education Program 188
Overall results 189
Perception by each group 191
Evaluation by subject 191
Evaluation by gender 192
References 193
Questionnaire: Survey of Graduates of Alternative Teacher Preparation Program 194

Section 6. Attitudes of Alternatively Prepared Teachers 201

Introduction 202
Georgia's Alternative Certification Program 202
Alternative Certification 203
Teaching Attitudes 204
Method 205
Collection of Data 207
Instruments 207
Treatment of the Data 209
Results of Interviews 219
Summary and Conclusions 220
Recommendations 223
References 225

Section 7. Stages of Concern of Alternatively Prepared Science Teachers 229

Introduction 231
Procedures 233
Interview Questions 236
Results 237
Discussion 240
References 243

Section 8. The TEEMS Proposal 247

Abstract 250
Introduction 251
Unifying Principles: Constructivist Learning 252
School-Based Sequenced Phases 252
Intern-Mentor Teaching Experience 253
Goals and Objectives of the TEEMS Project 255

Concepts and Definitions 256
Components of the Project 257
Tasks 257
References 259

Section 9. The TEEMS Curriculum 261

TEEMS Curriculum Plan Graphic 263
TEEMS Program 264
Program of Study 265
Proposed Holistic Schedule 267
Attainment of Program Outcomes 269
Course Syllabi 274
Introduction to Secondary Teaching 274
Methods and Materials for Teaching Science 280
Methods and Materials for Teaching Mathematics 286

Section 10. APPENDIX 291

Alternative Teacher Preparation Institute Application Forms 292
Interview Forms 298
Evaluation Forms 299
Acceptance Letter 302

1

Overview

Overview

This sourcebook and report describes the results of the Alternative Teacher Preparation Institute for Secondary Foreign Language, Mathematics and Science Teachers at Georgia State University, 1989 - 1992, as well as a plan to implement an alternative graduate level teacher preparation program for initial certification of secondary mathematics and science teachers. This new program is based on reflective and constructivist models of learning, and will be set in a holistically organized pedagogical and content curriculum. The new program is referred to as the TEEMS Project (Teacher Education Environments in Mathematics and Science). Much of the rationale, and curriculum plan for TEEMS was based on the experience we had with the Alternative Teacher Preparation Institute.

Purpose of this Sourcebook

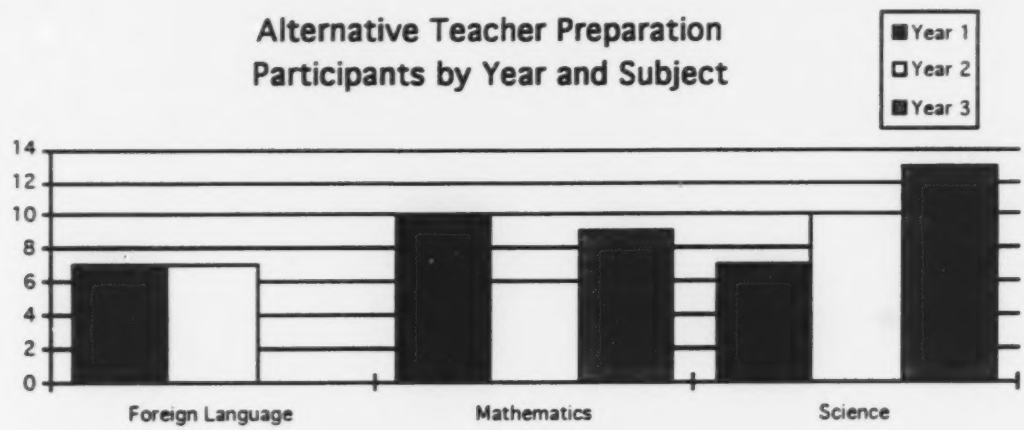
This Sourcebook contains a record of the research and development activities of the Alternative Teacher Preparation Institute and the TEEMS Project for the period of June, 1989 - June, 1993. The sourcebook contains the proposals, curriculum plans, research and policy discussions, as well as a plan for a new graduate level initial teacher preparation program for mathematics and science teachers. The Sourcebook should be of interest not only to mathematics, science and foreign language educators, but any educator responsible for the preparation of middle and high school teachers.

The GSU Alternative Teacher Preparation Institute

The Alternative Teacher Preparation Institute provided a practical approach to the preparation of beginning secondary teachers by providing an intensive Summer Institute component followed by a one-year internship under the direction of mentor teacher. The interns, although fully employed by the cooperating school districts, participated in a seminar program that met once-a-month at Georgia State University.

Sixty nine teachers were prepared in the Alternative Teacher Preparation Institutes from 1989 - 1991. Foreign language, mathematics and science teachers were prepared in

the first two institutes, while only mathematics and science teachers were prepared in the third. As shown in the graph below, 14 were foreign language, 25 mathematics and 30 science. Of the sixty nine teachers that were prepared, sixty three were able to obtain teaching positions in Georgia. Fifty seven of these teachers are currently teaching representing a retention rate of 90 percent.



The curriculum of the GSU Alternative Institute was based on a design that integrated three themes---pedagogy, the nature of the student, and the process of teaching. The curriculum was planned and implemented holistically by a staff of GSU professors, secondary teachers, and consultants drawn from the ranks of classroom teachers, supervisors, and college professors.

The Summer Institute was a six-week program that integrated clinical teaching, methods of teaching (foreign language, mathematics and science), human growth and development and the special education. Although practical in scope, the Summer program was designed to get the interns ready for the induction phase of the program in which they would be engaged in a full-time internship in a public school under the direction of a mentor.

The one-year internship program was organized in collaboration with the public schools. Each intern was assigned a mentor teacher who was identified by the school system. A mentor training program was planned, and each mentor participated in a one-week training program that was conducted during the last week of the institute. This provided an opportunity for interns and mentors to begin making plans for the school year.

A seminar program was designed to compliment the internship experiences. Each month interns and mentors met on the campus of Georgia State University for a seminar program. The monthly seminars were designed to provide time for debriefings, and for the presentation of a topic that was related to on-the-job practice.

TEEMS

One of the major outcomes of the Alternative Teacher Preparation Institute program was the opportunity it provided for college and university faculty to rethink the nature of teacher education, and to begin to visualize and plan for new approaches to teacher education.

Numerous national reports have pointed out the crisis in science and mathematics education, both at the college as well as the pre-college level. There is a declining interest in science and mathematics; many students turn off to science and mathematics before reaching high school. The science and mathematics scores of students show serious deficiencies.

Research in learning theory, which played an important role in the design and implementation of the Alternative Teacher Preparation Institute, indicates that knowledge is not a currency to be passed from teacher to the student, but rather knowledge is acquired through experience---students learn best when they are actively involved in the educational process.

As a result of the convergence of our work in alternative teacher preparation, the national crisis in science and mathematics, and the emerging epistemology of

constructivism, we began to think about a new program for the preparation of mathematics and science teachers. The underlying framework for the new program is constructivism, which suggests that human beings construct knowledge through acting on their environment and interacting with other humans. The work to design, and eventually implement this new program is called The TEEMS Project (The Teacher Education Environments in Mathematics and Science Project).

The TEEMS Project curriculum has been approved by the Department of Curriculum and Instruction, and is expected to be approved by the Professional Education Council of Georgia State University. Students for this new program will be recruited starting in January, 1994, and the program will commence in the Summer Quarter, 1994. The TEEMS Project is a five-quarter curriculum designed to prepare a new cadre of mathematics and science teachers for Georgia's schools.

Highlights of Research and Development Activities

• An alternative teacher preparation program based on reflective teaching, constructivism, and inquiry was implemented for a three-year period resulting in the preparation of 69 foreign language, mathematics and science teachers.

• The curriculum of the alternative program was organized holistically around pedagogy, nature of students, and the processes of teaching.

• 91% of the alternatively prepared teachers were hired by schools in Georgia. Over 90% of these interns are still teaching in Georgia's schools.

• 62.5% of the participants were classified as having high student-centered educational attitudes.

• The educational attitudes of the alternatively prepared teachers remained consistently high student-centered over a three year period.

• The two major concerns expressed by participants were discipline and motivation.

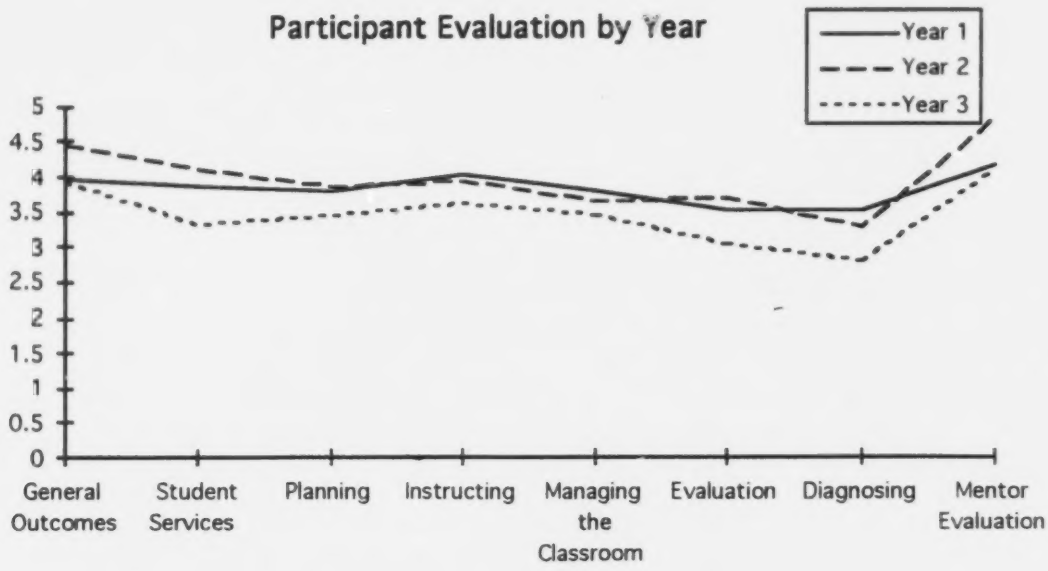
• Results of interviews on teacher concerns indicated that the institute tended to focus on student-centered outcomes (e.g. motivation, emotional needs, feelings of accomplishment, reaching one's potential).

• The majority of alternatively prepared teachers indicated that they would teach until they retire.

• Participants rated the quality of guidance they received from their mentors highest among the seven categories used to rate the alternative teacher preparation program.

• Of the five pedagogical areas surveyed (planning, instructing, managing the classroom, evaluation, and diagnosis), instructing was rating highest and diagnosis was rated lowest by the participants.

• The profiles of scores for each year were parallel. Although the scores for the third year were lower than the first two years, the differences were insignificant.



• A masters degree program for the initial certification of mathematics and science

teachers that emerged out of the Alternative Teacher Preparation Program was designed and approved by the Department of Curriculum and Instruction.

A Look Ahead

The material in this sourcebook has been organized into 10 sections. The following are brief descriptions of the focus and purpose of each of the sections of the Sourcebook.

The Alternative Proposal. Written in 1989, this document is the original proposal that guided our work in the Alternative Teacher Preparation Institute. It contains the rationale, and curriculum plan for the Summer Institute as well as the year-long Internship program.

The Alternative Teacher Preparation Curriculum. This section includes the holistic curriculum plans used in the Summer Institutes, as well as examples of the course syllabi used in the program. The holistic curriculum charts give a day-by-day account of the curriculum, while the syllabi give insights into the content of the program.

On Alternative Teacher Preparation. This section contains a paper that describes the nature of alternative teacher preparation at GSU, the characteristics of alternative certification programs, and details about the rationale and approach of the GSU Alternative Teacher Preparation Program in foreign language, mathematics, and science.

Status and Perceptions of Alternatively Prepared Teachers. This section provides the results of a survey made of the participants in the Alternative Teacher Preparation Institute. Data is reported that includes the current status of the teachers who were prepared in the program, and their perceptions of the various components of the program.

Attitudes of Alternatively Prepared Teachers. This section contains a report of a research study investigating the educational attitudes of teachers prepared in the

Alternative Teacher Preparation Institute. Data were compared over a four year period to find out if attitudes had changed. Several alternatively prepared teachers were interviewed as part of the research study.

Concerns of Alternatively Prepared Teachers. What are the concerns expressed by alternatively prepared teachers? In this section, the results of a survey and interviews are described.

The TEEMS Proposal. This section describes the TEEMS proposal. The Teacher Education Environments in Mathematics and Science Project, a non-traditional plan to prepare mathematics and science teachers.

The TEEMS Curriculum. The TEEMS curriculum is a program to provide initial teacher preparation for students holding at least a bachelors degree in engineering, mathematics and science. The curriculum is based on a holistic curriculum of pedagogy and content.

Appendix. The appendix contains recruitment brochures, application forms, and evaluation forms that were used in the Alternative Teacher Preparation Program.

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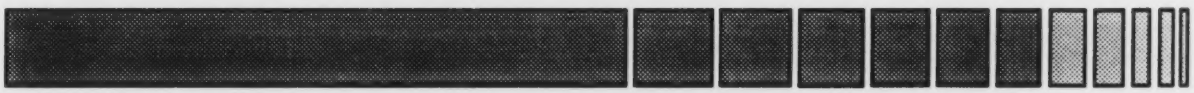

The Alternative Teacher Preparation Proposal

Alternative Teacher Preparation Institute For Secondary Foreign Language, Mathematics and Science Teachers

A Proposal Submitted to and Funded by the
Georgia Department of Education
1989, 1990, 1991

Department of Curriculum and Instruction
Georgia State University

Alternative Teacher Preparation Program
Georgia State University

Abstract

This proposal describes the plans to design and implement an alternative teacher preparation summer institute and academic year internship for 24 secondary foreign language, mathematics and science teachers, and 24 mentor teachers. The summer institute for the interns will be offered June 19 - August 4, 1989 for provisionally certified secondary educators teaching in metro-Atlanta area school systems. Two weeks of mentor training will be held July 17 - 28, 1989. Although this institute will be considered a non-residential program, during the week of July 24 - 28, interns and mentors will participate in residential training sessions at North Georgia College in conjunction with its teacher preparation institute directed by Rosalie Jensen.

The curriculum of the GSU institute is based on a design which uses three themes---pedagogical, nature of the student and process---and will be planned and implemented holistically by a staff of five GSU professors, and consultants (classroom teachers, and specialists). Based on the objectives and curriculum content of the alternative certification document, the director and the staff will design an instructional program that integrates the content of teacher preparation, rather than presenting it separately. Throughout the summer, interns will participate in a variety of activities---microteaching, reflective teaching, peer teaching, teaching assistant program---designed to facilitate the integration of content from methods, curriculum, special education and human growth and development. During the academic year all interns will participate in full year internship under the joint direction of a mentor and Jack Hassard, the director of the institute. Interns will receive 35 hours of college credit for participating in the summer institute (20 hours) and internship program (15 hours).

Mentors will receive the most current research based training on the supervision of beginning teachers. Under the direction of Edith Guyton, mentors will receive two weeks of training in the summer, and will meet as a group and jointly with interns during each of the three academic year quarters. In order to build in administrative support, a special workshop has been planned for principals and mentors at GSU early in the Fall quarter.

The alternative teacher preparation program will be evaluated using formative and summative participant feedback. In order to study the effectiveness of alternative program, a research study will be initiated involving the collection of data using questionnaires, interviews, participant logs, and video taping of the interns throughout the year. The research model is similar to the model used to study the effectiveness of the 1988 alternative institute.

1.0 Goals and Philosophy of the Alternative Teacher Preparation Institute

The goal of the alternative teacher preparation institute at Georgia State University is to provide a practical approach to the training of beginning secondary foreign language, mathematics and science teachers that is based on the most current pedagogical research-based knowledge, and reflects the pedagogical objectives as outlined in the document, Alternative Certification Program for Critical Teaching Fields. It is further intended that pedagogical, process, and nature of student themes derived from the Alternative Certification document, and other current sources of pedagogy will be organized into a holistic teacher preparation curriculum. The subject matter of this holistic curriculum---classroom management, curriculum organization, evaluation, delivering instruction, microcomputer technologies, human growth and development, and exceptional children and youth---will be interrelated, and experientially-based. Rather than viewing the three themes as separate fragments of teacher training, they will be joined holistically as shown in figure 1.

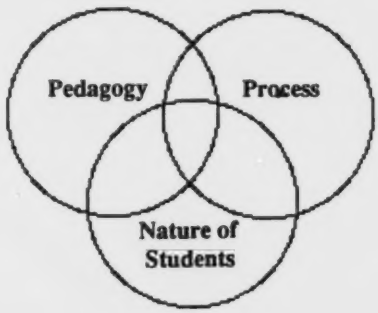

Figure 1. Holistic Teacher Preparation Model

The philosophy of the alternative teacher preparation program will be based on recent work on reflective teaching, inquiry learning, and experiential learning. Interns and mentors will be introduced to the following notions about pedagogy: 1). that teaching is fundamentally based on relationships and connections among teachers and students, 2). that teachers should create environments in which student are encouraged to be active learners, and 3). that using a variety of instructional methodologies will

benefit a wider range of students. Our goal is to prepare reflective, inquiry oriented beginning teachers who will work during the induction phase of teaching in a school setting under the supervision of a mentor. In order to demonstrate this philosophy, the institute staff will model behaviors---instructional and personal---that are based on a reflective, inquiry oriented approach to teaching.

The teacher preparation program will have a summer training component and an academic year internship component. The goals for each component are as follows:

Summer Training Component Goals:

1. interns will interrelate concepts and strategies and develop connections among the following pedagogical themes: managing the classroom, organizing the curriculum, delivering instruction (foreign language, mathematics and science education), and evaluating students' knowledge and skills.

2. interns will explore the nature of the students theme by correlating concepts from the study of human growth and development and exceptional children and youth.

3. interns will practice the planning, implementation and evaluation phases of teaching by participating in the following laboratory experiences (process themes) : reflective teaching, microteaching and peer teaching.

4. interns will develop a holistic model of teaching by perceiving pedagogical, process and the nature of student themes are part of a single model of teacher preparation.

5. Out of this holistic model of teaching, interns will examine the personal and human side of teaching by exploring topics relevant to their own personal and professional growth.

6. interns will develop observation skills, and classroom management strategies.

7. interns will develop instructional packages (TPAI Portfolios) based on appropriate models of teaching (e.g. direct/interactive teaching, inquiry teaching, holistic teaching, reflective teaching, cooperative learning).

8. interns will implement and evaluate the effectiveness of a variety of teaching strategies that are research based (e.g. inquiry teaching, lectures, demonstrations, cooperative groups, computer assisted strategies) in foreign language, mathematics and science teaching environments.

9. mentors will develop skills in observation, analysis and evaluation of teaching, and apply the knowledge of effective teaching in the observations, analyses, and evaluations of interns.

10. mentors will develop conferencing and communication skills.

11. mentors will develop a plan for working with and supervising interns for a full-year internship program.

12. interns and mentors will develop skills to enhance the intern-mentor relationship by jointly planning a series of supervision and coaching activities for the first month of academic year, viewing and critiquing episodes of teaching, e.g.

Academic Year Internship Goals:

1. to participate as an intern-mentor team in a one year, clinical teaching experience.

2. to demonstrate the effectiveness of pedagogical, the nature of the student, and process themes presented during the summer to the management, planning, and evaluation of secondary foreign language, mathematics and science classroom teaching.

3. to evaluate the effectiveness of a reflective, inquiry oriented philosophy of teaching.

4. to reflect on teaching by participating as an intern-mentor team and as a member of ongoing support group of beginning teachers.

5. to identify and explore problems that are unique to the induction phase of teaching and to collaborate as a team in the resolution of these problems.

6. to participate as participant-observers in the study and research of the effectiveness of the alternative teacher training institute, the beginning teacher process, and intern-mentor process.

2.0 Curriculum and Instructional Design

2.1. Course credit.

The alternative teacher preparation program for beginning secondary foreign language, mathematics and science teachers and their mentors will be offered for college credit through the College of Education at Georgia State University.

Interns enrolled in the program will earn thirty-five hours of college credit. Although the student will receive credit for four courses in the summer, as the curriculum plan below shows, the content represented by these course areas will be presented holistically. The professors and consultants in the institute will work as a team, and will ensure a holistic approach to instruction. The courses will not be offered separately. Participants will receive credit as follows:

Summer 1989 Institute: (20 quarter hours)

EDMT 456	Methods and Materials of Mathematics for Secondary Education
or	
EDSC 457	Methods and Materials of Science for Secondary Education
or	
FL 426	Methods and Materials for Teaching Foreign Languages in the Secondary School
EDCI 452	Curriculum for Secondary Education
FED 305	Human Growth and Development
EXC 401	Exceptional Children and Youth

Academic Year (1989 - 1990) Internship: (15 quarter hours)

EDCI 472	Internship I (Fall Quarter, 1989)
EDCI 473	Internship II (Winter Quarter, 1990)
EDCI 474	Internship III (Spring Quarter, 1990)

Mentors enrolled in this program will earn ten hours of graduate credit as follows:

EDCI 767	Supervision of Student Teachers (Summer 1989)
EDCI 768	Internship in Supervision of Student Teachers (1989-90 Academic Year)

2.2. Summer Institute Curriculum

The summer institute will be a seven week (June 19 - August 4) intensive program of training for the interns, and two weeks of training for mentors. The organization of the training for the interns will be based on the 1988 Alternative Institute that was held in Athens. Dr. Hassard was involved in the design, planning, and implementation of the 1988 curriculum, and has based the current proposal on that experience. The following curriculum design is fundamentally a replication of the 1988 curriculum, with minor modifications.

The summer institute curriculum will be based on the integration of three themes (pedagogical knowledge, nature of the student and process) into a holistic plan. In addition to these themes, a theme entitled On becoming a teacher will be featured each week. This special theme has been added because of our experience with the 1988 institute, and discussions that were held at the intern/mentor conference in Macon, January 20 and 21, 1989. At the conference, interns identified a number of problems---how to deal with stingy veteran teachers, lack of administrative support, being burned out, motivating self and others, coping with the paper work. The on becoming a teacher theme will be a weekly seminar, utilizing guest speakers on some occasions, that will focus on topics such as stress reduction, time management, assertiveness and empowerment, and what's it like being a beginning teacher.

2.21. Overall Structure

In order to create a holistic pattern for the summer program, a weekly theme will be used to unify the work of the week. These themes are as follows:

- Week 1 Getting Started
- Week 2 Reflective teaching
- Week 3 Focusing on learning and learners
- Week 4 Models of teaching
- Week 5 Learning from teaching
- Week 6 Learning from each other---interns and mentors
- Week 7 Preparing for school

The content of the institute for the interns will be organized into three major themes: pedagogical,process, and the nature of students. The content from each will be integrated throughout the summer as shown in the scope and sequence chart (Figure 2). The core faculty (Hassard, Johnston, Kaufman, Blount, and Lambros) will work together to reinforce the connections among the themes. Because of their holistic nature, the process themes (reflective teaching, microteaching and peer teaching) will constitute another fundamental way to integrate content of the summer institute.

Figure 2: Summer Institute Scope and Sequence

	M	T	W	T	F
Week 1: Getting started	Introd to institute C.M.	R.T. HG&D Delivering instruction	C.M. EMPAC Computers	R.T. D. I.	Exceptional Students Becoming a teacher
Week 2: Reflective Teaching	R.T. Foxfire groups	N.S.	R.T. C.M. B.T.	N.S.	C.M. EMPAC
Week 3: Focusing on learners and learning	Micro-teaching Evaluating learners	Holiday	School visit Evaluation of learner B.T.	N.S. D.I	N.S. Foxfire groups TPAI
Week 4: Models of teaching	School N.S.	School D.I	School C.M B.T.	School D.I.	Analysis of school visits C.M.
Week 5: Learning from teaching	Coop-learning Session with mentors	N.S. D.I.	Micro-teaching C.M. B.T.	N.S. D.I.	N.S. C.M.
Week 6: Learning from each other--interns and mentors	**Residential traing sessions at N. Georgia College; interns and mentors. Integration of intern and mentor training under the direction of Jack Hassard and Rosalie Jensen.**				
Week 7: Preparing for school	**Peer teaching session and video tape analysis and foxfire reports on the nature of students**				

Themes

Pedagogical
- Classroom management
- Organizing the curriculum
- Evaluating students knowledge and skills
- Microcomputers
- Delivering instruction: foreign language, mathematics, science

Nature of the Student
- Human growth and development
- Exceptional children and youth

Process
- Reflective teaching
- Microteaching
- Peer Teaching

On Becoming a Teaching
- Stress managment
- Motivation
- Time management

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The scope and sequence chart shown in Figure 2 is a tentative model of activities. The actual arrangement of the themes will change once the staff begins to meet in March. However, it does depict our plan for the integration of the content of the summer institute. During the first five weeks interns will be involved in a variety of activities based on the pedagogical, nature of the student, and process themes. During week 6 (July 24 - 28), all interns and their mentors will participate in a residential program of activities at North Georgia College in conjunction with the institute directed by Rosalie Jensen. The interns will return to Georgia State University during week seven to prepare for the fall teaching assignment, and to participate in foxfire and peer teaching sessions.

Figure 3 shows the first week's schedule, signaling the nature of other weeks. Except for the Tuesday and Thursday afternoon sessions, in which specialized instruction will be presented in foreign language, mathematics and science education, the interns will be organized as single group for instructional purposes. Foreign language, mathematics and science interns will often work together to encourage the importance of interrelating content, and help develop a holistic picture of secondary school teaching.

Figure 3. The First Week's Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
Morning 8:30 - 11:30	Overview Getting acquainted Introductory activity with entire staff	Introduction: reflective teaching Planning session for human growth and development	Classroom management: Introduction to EMPAC Tapes: 1: Teaching styles and learning	Refective Teaching: Rounds 1 and 2	Exceptional students and the teaching of foreign language, mathematics and science
Afternoon 1:00 - 5:00	Classroom management: •beginning class the period & school year	Delivering instruction: separate sessions: •foreign language •math •science	Microcomputers: • hands-on experience; learning word processing • guided practice	Delivering instruction: •foreign language •mathe •science	Classroom management: • time on task • learning styles Weekly evaluation

Throughout the summer, the institute staff will enhance the experiential and inquiry nature of the institute by modeling and demonstrating behaviors they expect interns and mentors to master.

2.22. Pedagogical Themes

The pedagogical content for the interns will be based on 1). the document, "Alternative Certification Program for Critical Teaching Fields," 2). knowledge and skills derived from the AFT's Educational Research and Dissemination Program (which was used in the TRIPS training, and in the clinical teaching course at Georgia State), and 3). current literature and practice on effective teaching. The pedagogical themes, and their relationship to the objectives of the Alternative Certification Program for Critical Teaching Fields, are described below:

Pedagogical Theme 1. Classroom Management and Communication

The content of this theme area will be focused on helping interns establish routines and rules of classroom behavior, as well as identifying and correcting disruptive behavior. Establishing a positive learning climate, stimulating student interest, and initiating and maintaining communication with the class are the other topics in this theme area. Objectives 1 - 14, pages 9 through 17 will be covered in this pedagogical area.

As with all areas of the institute curriculum, students will be involved experientially in learning about classroom management and communication. Formal sessions on these topics will be held, and students will be involved in laboratory sessions (process themes) which will provide opportunities to demonstrate classroom management and communication strategies during the summer.

Interns will also work briefly in a summer school program to observe the management styles of teachers. We have contacted the Cobb County School system, at their invitation, to explore the possibilities of placing groups of students in secondary classes.

Instructional activities will be based on three AFT Educational Research and Dissemination units, (Research on effective classroom management for the beginning of the school year, effective group management practices, and time on task), and the video/text curriculum "Effective Management for Positive Achievement in the Classroom," which is part of the Great Teacher Series produced by Universal Dimensions. The AFT ER&D units include state of the art papers on topics related to effective teaching written by practitioners while on leave at either Stanford University, Brown University or Michigan State. They include hands-on activities to help beginning teachers actualize the research-based knowledge in each unit. Additional ER&D units will be used in other areas of the Institute curriculum.

The video and text series, which was used last summer, introduces the interns to the following concepts about effective management through text material and video tapes:

- How teaching styles affect classroom management
- Creating a positive classroom atmosphere
- Guidelines to effective classroom management
- The role of student contracts in classroom management
- Discipline approaches in the classroom

The video tapes feature ten different teachers and how they deal with classroom management issues. Actual classroom scenes, discussions with students, and interviews with the teachers make this series a very effective program with beginning teachers.

Pedagogical Theme 2: Organizing the curriculum

Objectives 1 through 12 on pages 20 - 24 of the alternative document will be covered. Knowledge about the curriculum will be presented from generic and specialized (foreign language, mathematics and science) points of view. Interns will be involved in curriculum content such as identifying and sequencing instructional objectives (behaviorally and conceptually), defining and demonstrating strategies of instruction, selecting resources and determining evaluation measures for instruction. The content from organizing the curriculum will be integrated with the interns' specialized field, e.g foreign language, mathematics or science. Interns will develop a TPAI unit in their subject area in which objectives, materials, strategies and evaluation techniques will be demonstrated. Further, the process themes of reflective and

microteaching will reinforce and provide a laboratory environment to demonstrate knowledge of objectives, and strategies of planning and instruction.

Pedagogical Theme 3: Delivering Instruction

This pedagogical area refers to methods of foreign language, mathematics and science education. The content for these areas is based on the objectives in the alternative document under the heading foreign language instruction (objectives 1- 9, pages 26 - 31, mathematics instruction (objectives 1 -10, pages 35 - 43) and science instruction (objectives 1 - 8, pages 47 -51), as well as additional topics suggested by Professors Lambros (foreign language) Johnston (mathematics) and Hassard (science). The content in the two areas will be presented in separate sessions to the foreign language, mathematics and science interns. Interns will meet twice a week for methods instruction in their specialized area. The topics that will be presented in each area are as follows:

Foreign Language Instruction Topics:

1. Methodologies in transitions
2. The role of context
3. Developing oral proficiency
4. Listening and reading
5. Planning instruction
6. The accuracy issue
7. Becoming proficient in writing
8. Teaching for cultural understanding
9. The adolescent and classroom control
10. Classroom testing

Mathematics Instruction Topics:

1. Nature of mathematics instruction
2. Inside the mathematics classroom
3. Strategies for teaching mathematics
4. Teaching mathematics: the content and methods
5. Materials, media and technology
6. Teaching every student
7. Outside the classroom

Science Instruction Topics:

1. An inquiry in to science teaching
2. How adolescents learn science

3. Philosophy, goals and objectives of science teaching
4. Models of science teaching
5. Strategies and techniques of science teaching
6. Planning and evaluating in science teaching
7. Managing the science classroom
8. Computers and other technologies in science teaching
9. Science, technology and social issues

Pedagogical Area 4: Evaluating Students' Knowledge and Skills

Objectives 1 - 7 on pages 54 - 57 will be covered. Interns will be involved in two evaluation workshop sessions in which they will write test items including those appropriate for pre-tests, quizes, and summative evaluations. They will also be introduced to an experienced teachers' evaluation and grading system, as well as discuss the philosophy of evaluation and grading. Interns will apply the knowledge of evaluating students' knowledge and skills in the TPAI unit, as well as in reflective teaching sessions.

Pedagogical Area 5: Microcomputer Technology

Responsibility for microcomputer technology will be shared by Drs. Johnston and Hassard. Initially, participants knowledge of microcomputers will be assessed in order to provide them with appropriate experiences. However, all participants will receive some hands-on experience with microcomputers. The College of Education has a modern microcomputer center, and participants in the institute will be able to use this facility. In addition to this facility, the Educational Media Center, located in the Pullen Library has Apple, IBM and MacIntosh computers available for students. The Department of Curriculum and Instruction has a microcomputer facility which will also be available to the interns.

Twin themes will guide the instruction in microcomputers: learning with and learning about computer technology. Interns, if they are not familiar with one, will be introduced to a word processing system early in the summer, and will be able to use the computer as a tool for assignments, and the preparation of teaching materials.

The objectives that will guide microcomputer instruction include:

1. identify how computers and other technologies should be used in the school curriculum, especially in foreign language, mathematics and science instruction.

2. describe how software programs can be used to facilitate the learning of content objectives. Interns will be exposed to a

large number of outstanding software programs related to the content areas.

3. describe activities that can be used to help teachers and students learn about microcomputers.

4. describe how the computer can be used as a tool for the teacher.

2.23. The Nature of the Student Themes

The Nature of the Student Area 1: Human Growth and Development

All the objectives (1 - 49, pages 59 to 80) will be covered. The content in the human growth and development area will be handled in a unique manner. The interns will be organized into small group cooperative teams, called "foxfire groups," to explore one area of human growth and development. The areas the interns will choose from include: physical development of adolescents, personality development, social development, cognitive development, moral development, and adolescent sexuality.

Each team will be responsible for working together as a coop-coop team (after Kagan) in order to make an experiential presentation to the entire group of interns during week 7. Coop-Coop is a model of cooperative learning developed by Spencer Kagan at the University of California, Riverside and will provide a working model that the secondary interns will be able to implement in their own classrooms.

Professor Parker Blount from the Department of Educational Foundations at Georgia State University will work directly with the interns as a facilitator and advisor. Time will be provided in the curriculum plan for the cooperative teams to meet together, and with professors for consultations. The mentors will be asked to make periodic reports to Dr. Blount during the research and preparation time leading up to the presentation day.

Nature of the Student Area 2: Exceptional Children and Youth

The pedagogical area of exceptional children and youth will be presented by Dr. Mel Kaufman, professor of Special Education at Georgia State University. The sessions with Dr. Kaufman will be

integrated into the curriculum design with the other pedagogical content. The sessions on exceptional children and youth will deal with: the major provisions of P.L. 94-142, identification of student behaviors that warrant referral, characteristics of mentally handicapped, specific learning disabilities, behavior disorders, severely emotionally disturbed, visually-impaired, deaf-blind, speech-language disorders, hearing-impaired, orthopedically handicapped, and gifted, the referral and IEP process, uses of assessment information, educators' responsibilities regarding the student with special needs, resources for teaching, teaching strategies, working with parents, and cooperating with special education personnel.

2.24. Process Themes

One of the unique characteristics of the 1988 institute was the involvement of the interns in several laboratory teacher training activities, which we referred to as "process themes." The process themes are clinical experiences that enable the intern to "process" the act of teaching in different forms. The models include: reflective teaching, microteaching and peer teaching. The process themes and associated activities will be used to create situations in which the interns think reflectively, evaluate teaching episodes, and integrate the pedagogical knowledge to laboratory teaching situations. Reflective teaching will be introduced in weeks 1 and 2, microteaching in weeks 3 and 4, and peer teaching in week 7.

Another purpose of the process themes is they can be used as tools for the interns and mentors when they begin the academic year internship. The philosophy of being reflective, as well as working on specific teaching skills, and occasionally observing video tapes of their teaching will be suggested as integral intern-mentor activities.

Reflective Teaching

Reflective teaching is a laboratory teaching model, developed at Ohio State University, and published by Phi Delta Kappa. It is a form of peer teaching in which interns experience the complete act of teaching: planning, execution and evaluation. It develops skills and processes enabling the interns to critique and reflect on the process of teaching.

The interns will be divided into groups of five or six. One person will be designated to teach a Reflective Teaching Lesson (RTL). The RTLs are a series of lesson plans which contain background information about the lesson, objectives, materials needed, and special conditions and notes on ending the lesson. Assuming there will be about five groups of interns, five interns will teach the same RTL during the first round of reflective teaching. Designated teachers will teach the lesson, administer evaluation instruments (cognitive and affective), and conduct a reflective teaching discussion and feedback session. At the end of these sessions, all interns will be brought together for a large group discussion to explore questions such as How successful was your methodology in bringing about learning and satisfaction? What did your teacher do to make learning successful? What was the reaction of the learners to the lesson?

Microteaching

In microteaching, specific "technical" skills are practiced with a small group of pupils who may be peers. Microteaching, developed by Allan and Ryan at Stanford University, provides a model which differs from reflective teaching. In microteaching, interns present a 5 minute lesson in order to demonstrate a skill (e.g. varying the stimulus situation, instructional set, illustration and use of examples, questioning, reinforcement, closure). The lesson will be video taped, and used in a playback and critique session in a small group. Based on the feedback in the critique session, the intern will "reteach" the lesson to a new group of students by incorporating the feedback into the second lesson.

A special booklet, entitled "Microteaching: Developing communication skills for effective classroom teaching (Hassard, 1988), which was used in the 1988 institute will be used with the interns. It provides information about each of the skills identified above, and evaluation sheets used during the feedback session. The microteaching skills that the interns practice are correlated with the "direct/interactive instructional model" which will be introduced. The direct/interactive model, based on the work of M. Hunter and B. Rosenshine is based on the effective teaching model, and has been shown to be a very effective model with beginning teachers.

Each student will have an opportunity to teach a micro-teaching lesson, and be a member of a feedback group.

Peer Teaching

Peer teaching lessons will be drawn from the TPAI unit that interns develop in their subject area. Each intern will present a thirty minute lesson to a group of interns. The lesson will be video taped, and each intern will view the tape with a group of peers during a feedback and critique session.

The peer teaching sessions will be the culminating activity for the TPAI unit that interns develop during the institute. Prior to the peer teaching sessions, each intern's unit will be evaluated by their methods professor using the Georgia Teacher Performance Assessment Instruments. The peer teaching will give the interns additional feedback on the effectiveness of their lesson plans.

2.25 Mentor Training

During the summer institute all mentors will receive two weeks of specialized training based on current research in the field. Dr. Edith Guyton will conduct the mentor training.

During the first week of mentor training (July 17 - 21), the mentors will meet separately for specialized training. During the second week (July 24 - 28) they will be involved in joint activities with the interns at a residential session at North Georgia College.

The curriculum objectives for the mentor training will be as follows:

1. work effectively with interns
2. develop effective conferencing skills for working with interns in a beginning teaching situation.
3. become familiar with the research on student teaching and supervision.
4. develop reflective teaching skills.
5. develop a plan for working with their intern during the 1989 - 1990 academic year.

During the academic year, the mentors will be involved in a practicum course on the supervision of interns. They will meet for seminars at GSU three times during the Fall quarter, twice during the Winter Quarter, and once during the Spring quarter. Two of these sessions will be jointly coordinated with the interns, who will be meeting monthly with Dr. Hassard.

3.0 instructional Delivery System

3.1 Overview

The instructional delivery system will consist of a 7 week summer institute followed by a year-long internship. Instruction will be organized into a holistic model, as described in section 2.0. The instructional system is shown in Figure 4.

Figure 4. Instructional Delivery System

The summer program will also include two weeks of training for mentors. Interns will be involved with the mentors during the second week of mentor training. During the academic year internship period the interns will meet for nine monthly three-hour seminars at Georgia State University. Mentors will meet with the interns during two of these seminars, and will also meet separately on four occasions.

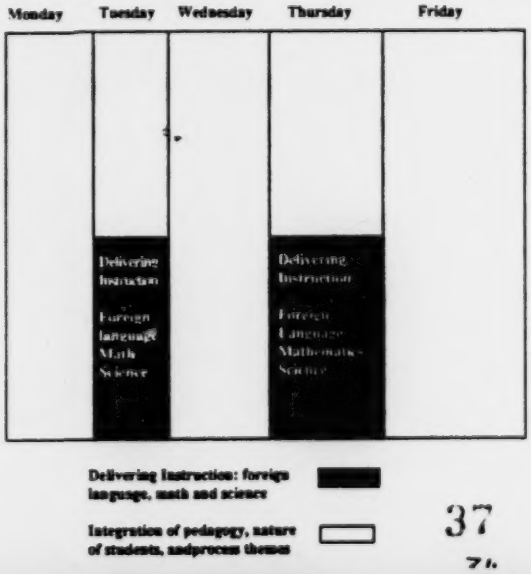
In order to enhance administrative support, a seminar for principals and mentors will be held during the Fall at Georgia State. Drs. Hassard and Guyton will outline the scope and purposes of the alternative teacher preparation program focusing on the importance of the internship program, and ways in which principals and other administrators can support the beginning teacher.

3.2. Summer Institute: Interns (Seven Weeks)

Weeks 1 - 5, (non- residential)

The interns will meet from June 19, 1989 to August 4, 1989 Monday through Friday from 8:30 AM to 5:00 PM. As shown in Figure 5, the interns will meet as an entire group each day, except for Tuesday and Thursday afternoons. On these days, the interns will meet in their subject matter groups for instruction in either foreign language, mathematics, or science methods. The pedagogical, nature of the student, and process themes identified in section 2.0 will be integrated into a holistic plan of instruction throughout the summer. The model of instruction as shown here will be used during weeks 1 through 5.

Figure 5. Holistic Instructional Plan



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Week 6. (Residential)

During week 6, the interns and mentors will meet in a residential setting (at North Georgia College) for a week of interrelated activities. During this week interns will be involved in peer teaching, and meeting in subject matter groups with their mentors, and subject matter coordinators from the Department of Education. Specialized activities to enhance the intern-mentor relationship will also be planned. For instance, two veteran intern/mentor teams from the 1988 institute will present a session based on their experience during the 1988 - 89 school year.

Mentors, having already been trained during the previous week in observation, evaluation and conferencing techniques will join with the interns to participate in intern-mentor simulations. During these small group sessions, interns will teach short lessons to peers. The lessons, which will be video taped, will be observed by a mentor. These sessions will be used to enhance communication among interns and mentors, and to give the mentors opportunities to demonstrate abilities in observation, evaluation and conferencing.

A special feature of the week will be presentation of model lessons by mentors.

Week 7 (non-residential)

During the final week, the interns will return to the campus of Georgia State University to complete the peer teaching sessions, and the foxfire cooperative group reports on human growth and development.

3.2. Summer Institute: Mentors (Two weeks)

The mentors will receive two weeks of training. During the week of July 17 - 21, the mentors will meet separately with Dr. Guyton. The instruction will include research-based mentor training sessions focusing on research related to mentoring and supervision of interns, practical work on observation and evaluation skills, effective teaching research, simulated intern-mentor conferences to develop communication and conferencing skills, and specific strategies and plans for working with the interns during the academic year internship period.

The second week of mentor training will be conducted in conjunction with the interns. Details of the this week are outlined above in the intern section.

3.3. Academic Year Internship

The academic year internship will be conceptualized holistically as an integrated process among the intern, mentor and college professor. Figure 6 illustrates this holistic relationship. This model has been the basis of the TRIPS intern/mentor program in the Atlanta Public Schools in cooperation with Georgia State University. Dr. Hassard has worked with the TRIPS program over the past two years putting this model into practice. A close relationship will be established among intern/mentor teams and the college professor.

Figure 6: Internship Training Model

The intern-mentor relationship is the primary focus of the year-long internship. The supervision of the interns will be a shared responsibility between the mentor and the college professor (Dr. Hassard). Each intern will be enrolled in a sequence of internship courses at Georgia State University under the direction of Dr. Hassard. Concurrently, each mentor will be in a supervised practicum on the supervision of beginning teachers under the direction of Dr. Guyton. Drs. Hassard and Guyton will work closely, and three occasions host joint seminars involving mentors and interns.

Interns will meet for nine monthly seminars at GSU with Dr. Hassard. The purpose of these seminars is three fold:

1. provide a support group for the interns during their first year of teaching, and provide an opportunity to engage in discussions of topics that are directly relevant to the interns. Part of each seminar will be devoted to a discussion of classroom teaching problems and alternative solutions. The importance of providing a forum for first year teachers to discuss problems have be shown to be successful in the TRIPS program that Dr. Hassard is directing at Georgia State during the 1988-89 academic year. Further evidence for the value of this objective was the result of the intern/mentor conference held in Macon on January 20 -21, 1988. Interns identified the need to discuss a number of problems common to beginning teachers such as motivating students, dealing with the administration, excess paper work, discipline problems, communication with veteran teachers, and many others.

2. observe video tapes of each others' classrooms (in small groups) in order apply the reflective and inquiry oriented philosophy of teaching developed during the summer institute.

3. discuss topics related to the pedagogical and nature of the student themes covered during the summer: a) classroom management and communication, b) organizing the curriculum, c) delivering instruction, d) evaluating students' knowledge and skills, e) human growth and development, and f) exceptional children and youth. These will form the framework for the scheduling of topics during the seminars.

Mentors will meet six times during the year to view video tapes of the interns, discuss the intern-mentor process, and explore topics related to working with beginning teachers.

4.0 Selection and admission of interns and mentors

We are seeking interns and mentors who will be employed in the metro-Atlanta school systems. A meeting was held on October 19, 1988, between staff development personnel of several metro-Atlanta school systems (Atlanta Public Schools, Fulton County, Dekalb County, Cobb County, Gwinnett County, Decatur City, Rockdale County, Douglas County, Clayton County) and faculty at Georgia State University. At the meeting the need for a summer institute in the metro area, and the value of intern-mentor programs was discussed. The districts in attendance made suggestions about such an

institute, and agreed to cooperate in a summer institute and internship program.

In order to facilitate the selection of intern/mentor teams, a letter was sent on January 26, 1989 to each of the metro-Atlanta school systems asking for information regarding the number of interns they will be employing during the 1989 - 90 school year, and in what content area (foreign language, mathematics and science).

The director of the institute will work closely with the cooperating school districts in the selection of intern/mentor teams.

The following criteria will be applied in the selection of intern/mentor teams for the alternative teacher preparation institute at Georgia State University.

4.1 Selection of Interns

Interns will be identified by the cooperating school systems. Candidates eligible to participate in the summer institute will:

1. hold a bachelor's degree from a regionally accredited college or university with a degree major and coursework that will satisfy subject matter requirements for certification in foreign language, mathematics, or science.
2. have an overall grade point average of 2.5 on a 4.0 scale for coursework in the baccalaureate degree.
3. pass the appropriate Teacher Certification Test prior to the summer institute.
4. be available from June 19 - August 4, 1989 to attend the summer institute at Georgia State University, and be willing to participate in the residential portion of the institute to be held at North Georgia College, July 24 - 28, 1989 in conjunction the summer institute directed by Dr. Rosalie Jensen.
5. be employed (under contract) for the 1988 - 1989 school year in a participating school system. The institute will consider candidates who meet the other criteria but do not currently hold a teaching position in one of the participating metro districts. Candidates without teaching positions will only be considered after all employed intern applications are reviewed.
6. be admitted to Georgia State University as a postbaccalaureate student, and be admitted to teacher education in the College of Education. The criteria for admission to teacher

education include criteria 1 and 2 listed above plus successful completion of the English core, and demonstrated competence in oral communication.

7. participate in a year long internship under the supervision of a mentor, and register for the internship sequence (EDCI 472, 473, 474) in the Department of Curriculum and Instruction.

8. be interviewed by a team comprised of the director, and summer institute staff members.

4.2. Mentor selection

Mentor selection will be made by the cooperating school district. However, it is important that mentors consent to the assignment, and show a strong indication or desire for working with beginning teachers. Mentors should meet the following criteria:

1. be in the same certificated field and in the same school.

2. hold at least a T-4 or PBT-4 in the field.

3. have had at least one year of experience in the participating school system.

4. be available from July 17 - 21 for training at Georgia State, and from July 24 - 28 for a residential training program at North Georgia College. Mentors will enroll in a graduate course on supervision of teachers.

5. participate as a mentor during the 1989 - 1990 academic year and register for a practicum course in supervision (EDCI 768); mentors must also be willing to participate in two intern/mentor seminars and four additional mentor seminars during the year at Georgia State University.

6. be a skilled practitioner, able to model exemplary practice, work well with beginning teachers, and be recognized by their peers for outstanding teaching qualities.

4.3. School system participation

The participating school system must:

1. employ the intern for the 1988 - 1989 school year.

2. assign the intern "in-field" for the majority of the school year.

3. provide a mentor teacher.

4. provide support to the efforts of the mentor teacher and activities of the teacher trainee through the principal and staff development coordinator. The school system must agree to have the principal of the participating school participate in one seminar to

learn about the intern-mentor program. The seminar will be held during the Fall for principals and mentors at Georgia State University to orient and inform the administrators about the internship program.

5.0. Record keeping

Record keeping will be a cooperative effort between the institute director and the participating school systems (primarily through the contact with the mentor teachers).

5.1. Portfolio and action plan

Each intern's record of progress will be maintained by means of an individual intern portfolio. The portfolio will contain an action plan for each quarter during the academic year (see the Appendix for models that were used by Dr. Hassard in the 1988 - 1989 TRIPS internship program at Georgia State University). The action plan will include activities and behaviors derived from the Alternative Certification Document activity summary sheets. Each intern will receive an action plan for the entire year during the summer institute, and will be involved in discussions of the action plan with their mentor and the director of the institute.

Action plans, which require a sign off by the mentor, will be submitted to the Director at the end of each quarter, and a final report will be submitted by the mentor at the end of the school year.

In order to provide time for the mentors, we are proposing that the project pay to release each mentor one day each quarter. We think this is important. This time will give the mentor the opportunity to meet with the intern (during the intern's planning period), view videos, and complete the paper work required each quarter. It will also provide the mentor with the time to complete other forms that related to the evaluation and research of the project.

5.2. Earned credit

The interns will receive 35 hours of credit, which will be recorded on the intern's transcript. During the summer institute the intern will sign up for 20 hours of credit. However, only 10 hours will be awarded (5 hours in human growth and development and 5

hours in exceptional children and youth). The remaining 10 hours credit (5 hours in methods, and 5 hours in curriculum) will be held until spring quarter because some of the objectives can only be fulfilled during the internship period. The intern will earn 5 hours credit each quarter (Fall, Winter and Spring) for a supervised internship. When all objectives on the action plan are met, then the interns will receive the 10 hours of credit for methods and curriculum.

6.0. Administrative and management system

6.1. Time line of events

1. Planning and development: Staff member meetings will be held to plan the detailed curriculum for the summer institute, and to discuss the holistic philosophy and approach of the institute. Several meetings will be held during the months of March and April. A complete curriculum plan will be prepared by mid-May.

2. Recruitment: Letters and brochures will be sent to the cooperating school systems by March 1, 1989 soliciting nominations and applications of intern/mentor pairs. The applications will be due on May 1, 1989. The deadline for application materials to the University is May 12, 1989.

3. Selection of intern/mentor teams: A selection committee, comprised of institute staff will meet during the week of May 1 and select the intern/mentor teams. The selection committee will be charged with selecting 8 intern/mentor teams in each of the content areas (foreign language, mathematics, and science). Applicants will be notified no later than May 15, 1989.

4. Summer institute program

Interns:
June 19 - July 21: non-residential institute sessions at GSU
July 24 - July 28: residential sessions at North Georgia College
July 31 - August 4: non-residential sessions at GSU

Mentors:
July 17 - July 21: non-residential training at GSU
July 24 - July 28: residential at North Georgia College

4. Academic year internship

Fall Quarter, 1989
- October 2: intern seminar*
- October: principal/mentor seminar
- October: mentor seminar
- November 6: intern seminar
- November: mentor seminar
- December 4: intern/mentor/ seminar

Winter Quarter, 1990
- January : intern seminar
- February: intern seminar
- February: mentor seminar
- March: intern/mentor seminar

Spring Quarter, 1990
- April: intern seminar
- May: intern seminar
- June: intern/mentor seminar/final

6.2. Administrative Structure

The administrative structure will be based on the model developed during the 1988 summer institute. Each theme will be headed by a coordinator who will work directly with the director in planning and implementing instruction in that area of the summer curriculum for interns and mentors. In addition to the coordinators, guest presentors will be invited to present specialized topics and issues to the interns.

Although a complete list of consultants has not been developed, some of the consultants that will be invited include: Dr. Sid Crow, Biology Department, GSU; Bob Jaber, high school science teacher, Fulton County, Mary Wilde, middle school science teacher, Fayette County, Irene Bowden, mathematics teacher, Atlanta Public

* All seminars will meet from 4:30 p.m. to 7:30 p.m. in the Urban Life Building at GSU

Schools, Pat Sharpton, science teacher, Gwinnett County, and Ed Thomas, mathematics teacher, Clayton County.

The staff of the institute, and the area of the institute curriculum they will coordinate is as follows:

Director: Dr. Jack Hassard*
Professor, Department of Curriculum and Instruction, Georgia State University

Coordinators:

Dr. Parker Blount Associate Professor, Educational Foundations Georgia State University	Human Growth and Development Instruction
Dr. Edith Guyton Director, Educational Field Experiences Georgia State University	Mentor Training
Dr. Jack Hassard Professor, Department of Curriculum and Instruction Georgia State University	Science Instruction Clinical Experiences Curriculum and Computer Instruction
Dr. Hiram Johnston Professor, Department of Curriculum and Instruction Georgia State University	Mathematics and Computer Instruction
Dr. Melvin Kaufman Professor, Department of Special Education Georgia State University	Exceptional Children and Youth Instruction
Dr. Anna Lambros Assistant Professor Department of Foreign Language Georgia State University	Foreign Language Instruction

* Vitas for all staff members are included in the appendix.

6.3. Personnel costs and records

Since tuition is being charged for the 35 hours of credit for the interns, staff members will be paid out of University departmental funds. Salaries will not be a direct cost of the proposal. However, faculty will be paid on the basis of 10% of their academic year contract for each five hour course they teach. The breakdown is as follows:

Dr. Hassard: 30% (science methods, curriculum and the supervision course)
Dr. Johnston: 10% (mathematics methods)
Dr. Blount: 10% (human growth and development)
Dr. Kaufman: 10% (exceptional children and youth)
Dr. Lambros: 10% (foreign language methods)

During the academic year, the institute will be charged 1/9 Dr. Hassard's AYI 1989/90 salary for administration, and he will be credited with a full teaching load for the internship course each quarter.

The project will be charged 1/5 Dr. Guyton's fiscal year salary for the evaluation and research component of the project.

7.0 Evaluation and Research

In order to determine the effectiveness of the Alternative Teacher Preparation Program, the following approaches will be proposed: 1) intern and mentor evaluation and feedback of the curriculum and instructional plan, 2) a research study to determine the effectiveness of the alternative teacher preparation program.

7.1. Intern/mentor evaluation and feedback

During the 1988 institute students completed weekly evaluation forms to provide the instructional staff with feedback on what was most effective in the instructional program, and what changes they would recommend be implemented. These weekly evaluations proved to be valuable.

The following procedures will be followed to solicit feedback from the interns and mentors:

1. Each Friday, interns will complete an evaluation form (copy included in the appendix) which will be turned in to the director. Results will be shared with the institute staff.

2. At the end of the fifth week, small groups will be formed to make recommendations for future institutes, and provide feedback on the current institute. Topics for discussion and feedback will include: schedule, activities and assignments, personnel, location, and follow-up.

3. During the seventh week, each intern will complete a summative evaluation form (see the appendix) which includes questions about the entire institute.

4. At the end of each quarter during the academic year, interns will complete evaluation forms.

5. Mentors will complete an evaluation form at the end of the first and second week of their training.

7.2. Research

Dr. Edith Guyton will supervise the research of the effectiveness of the Alternative Teacher Preparation Institute. The research will be based on a model used in the 1988 institute, and the TRIPS intern/mentor program in the Atlanta Public Schools. The model involves gathering descriptive data using questionnaires, interviews, and participant logs. In addition to this type of data, each intern will be video taped three times during the year by his or her mentor. The video tapes will be observed and analyzed using a systematic observation system.

The purposes of the research will be as follows:

1. to study and compare attitudes toward teaching and teaching performance of the participants in the institute with an equal number of beginning teachers not in the institute by means of survey data and questionnaires.

2. to observe the teaching behavior of beginning teachers, and describe changes in teaching behavior during the internship period.

3. to study the influence of the institute curriculum, beginning of the school year teaching experiences, the mentoring process on teaching attitudes and success.

4. to study the mentoring process and its effectiveness.

The following types of data will be collected:

Prior to Teaching: During the Summer

1. Demographic background survey information.
2. influences, attitudes and concerns survey

During the internship period

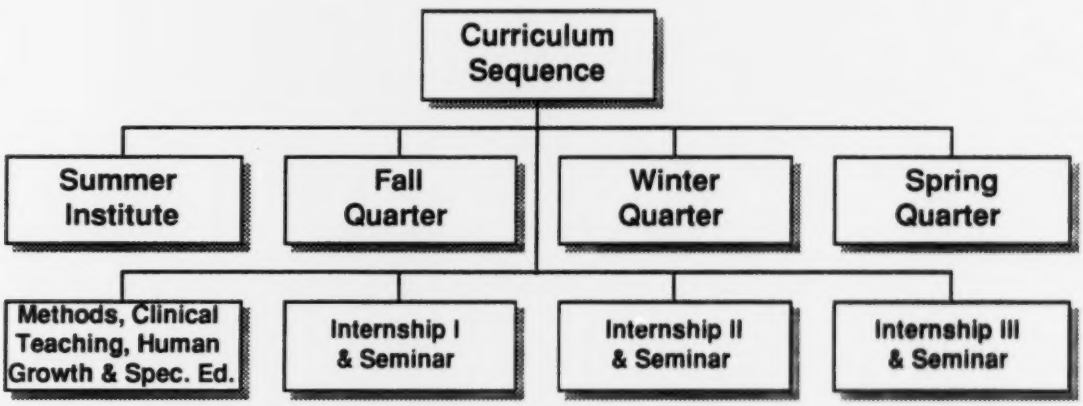
1. Education attitudes survey instrument (after the first month and end of the year).
2. Mentor attitude survey after first month, fourth month and end of the year.
3. Video tape of interns teaching a lesson at the beginning, middle and near the end of the school year.
4. Logs: a journal kept throughout the year by interns and mentors designed to describe thoughts and feelings, successes, problems and concerns. Logs will be turned at the monthly meetings held during the internship period.
5. Evaluation form assessing the nature and effectiveness of the intern-mentor process.

One other dimension of our research model is the connection we have with the U.S.S.R. Academy of Pedagogical Sciences. Dr. Hassard is director of the AHP Soviet Exchange Project at Georgia State University. GSU has agreed on a three year exchange program with the Soviet Academy of Pedagogical Sciences. One of the three research areas that the two organizations will work on is alternative models of teacher preparation. Drs. Hassard and Guyton, who have traveled to the Soviet Union, and who have hosted Soviet educators in Atlanta, will be reporting on the results of the alternative teacher preparation institute in the Fall of 1989 in Leningrad. .

3

The Alternative Teacher Preparation Curriculum

Alternative Teacher Preparation Curriculum Model



Alternative Teacher Preparation Summer Institute

Holistic Schedule

Georgia State University
Atlanta, Georgia
June 19 - August 3, 1989

Week 1---June 19 - 23

	Monday	Tuesday	Wednesday	Thursday	Friday
Session I 8:30 - 10:15	Coordinator: Dr. Jack Hassard Topic: Overview of the Institute; Getting Acquainted; What is an effective teacher? Some comments about research on becoming a teacher.	Coordinator: Dr. Jack Hassard Topic: The Reflective Teaching model. Class meeting: Discussion of managing ourselves; groups we need; ombudsmen	C: Dr. Parker Blount Topic: Interviewing Teachers	C: Dr. Jack Hassard Topic: Reflective Teaching Rounds 2 & 3	C: Dr. Jack Hassard Topic: Field Trip to the Microcomputer lab: Using the computer as a professional tool.
Session II 10:30 - 12	Reception: Introduction of the Summer Institute Faculty	Coordinator: Dr. Parker Blount Topic: Introduction to Human Growth and Development	C: Dr. Jack Hassard Topic: Reflective Teaching, Round 1	Guest Speaker: Susan Putzell Topic: Field Trip to the Curriculum Laboratory: Orientation, and a Production Workshop	C: Dr. Parker Blount Topic: Discussion of Interviews, and Formation of *Fouire Cooperative Groups* and Selection of Human Growth and Development Topics Class meeting: Weekly Feedback
Session III 1:00 - 4:30	Note: Session III for today will begin at 2:00 p.m. to provide time for obtaining books. Coordinator: Dr. Mel Kaufman Topic: Introduction to EXC 101 Exceptional Children and Youth	**Methods of Teaching in the Content Areas** Foreign Language: Kim Kendall Topic: The Proficiency Oriented Classroom Mathematics: Dr. Hiram Johnston Topic: The Nature of Mathematics Teaching Science: Dr. Jack Hassard Topic: An Inquiry into Science Teaching	C: Dr. Mel Kaufman Topic: Overview continued. Introduction to Gifted Education	**Methods of Teaching in the Content Areas** Foreign Language: Kim Kendall Topic: Planning and Evaluating in Foreign Language Teaching Mathematics: Dr. Hiram Johnston Topic: The Mathematics Curriculum Science: Dr. Jack Hassard Topic: How Adolescents Learn Science	Informal Lunch with Faculty

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Week 2---June 26 - 30

	Monday	Tuesday	Wednesday	Thursday	Friday
Session I 8:30 - 10:15	C: Dr. Jack Hassard Topic: Reflective Teaching Rounds 4 & 5	C: Dr. Jack Hassard Topic: Preparing for School Visits; Learning to Look into Classrooms: Effective Teaching Practices Instrument	Observation in Cobb County Summer School Classrooms	C: Dr. Jack Hassard Topic: Unit and Lesson Planning: A Process Approach	C: Dr. Jack Hassard Topic: The Direct Instruction Teaching Model; Workshop on Writing and Critiquing Direct Instruction Lesson Plans
Session II 10:30 - 12	Topic: Overview of Developing an Instructional Mini-unit; Instructional goals and planning	C: Dr. Parker Blount Topic: Research Time for *Foxfire Cooperative Groups*		C: Dr. Parker Blount Topic: Research Time for *Foxfire Cooperative Groups*	Class meeting: Weekly Feedback Informal Lunch with Faculty
Session III 1:00 - 4:30	C: Dr. Mel Kaufman Topic: The Gifted: Special Talents and Special Needs	**Methods of Teaching in the Content Areas** FL: Kim Kendall Topic: Developing Oral Proficiency in the Classroom M: Dr. Hiram Johnston Topic: The Beginning Teacher; Effective Teaching S: Dr. Jack Hassard Topic: Philosophy, Goals & Objectives of Science Teaching	C: Dr. Mel Kaufman Topic: Slow Learners	**Methods of Teaching in the Content Areas** FL: Kim Kendall Topic: Teaching Listening Comprehension M: Dr. Hiram Johnston Topic: Lesson Planning S: Dr. Jack Hassard Topic: Models of Science Teaching	

Week 3---July 3 - 7

	Monday	Tuesday	Wednesday	Thursday	Friday
Session I 8:30 - 10:15	Research and Planning	**July 4 no classes**	Observation in Cobb County Summer Classrooms	C: Dr. Jack Hassard Topic: Indirect Instructional Strategies	C: Dr. Jack Hassard Topic: Microteaching Session (I) on the following teaching skills: • Set Induction • Using Examples • Varying the Stimulus • Questioning • Closure
Session II 10:30 - 12	Research and Planning		Foreign Languae: Kim Kendall Topic: Becoming Proficent in Reading	Guest Speaker: Dr. Lucretia Payton Georgia State University Topic: Teaching Strategies & Techniques in Multi-cultural Environments, Part I	C: Dr. Parker Bount Foxfire Group Meeting Class meeting Weekly Feedback Informal Lunch with Faculty
Session III 1:00 - 4:30	Research and Planning	**Methods of Teaching in the Content Areas**	C: Mel Kaufman Topic: Physically Handicapped	**Methods of Teaching in the Content Areas** FL: Kim Kendall Topic: Promoting Effective Writing Skills M: Dr. Hiram Johnston Topic: Strategies for Teaching Mathematics S: Dr. Jack Hassard Topic: Science Teachers Talk About Teaching Guest Presenters: • Mary Wilde, Booth Jr. High • Barbara Broadway, Dunwoody High School	

Week 4---July 10 - 14

	Monday	Tuesday	Wednesday	Thursday	Friday
Session I 8:30 - 10:15	C: Dr. Jack Hassard Topic: Cooperative Learning in Secondary Classrooms	C: Dr. Jack Hassard Topic: Teaching Style and Classroom Management	Observation in Cobb County Classrooms	C: Dr. Jack Hassard Topic: Creating a Positive Classroom Atmosphere	C: Dr. Jack Hassard Topic: Microteaching Session II
Session II 10:30 - 12	C: Dr. Parker Blount Topic: Foxfire Presentation	C: Dr. Parker Blount Topic: Foxfire Presentation		C: Dr. Parker Blount Topic: Foxfire Presentation	Guest Speaker: Dr. Phil Gang Institute of Educational Studies Topic: Ecocentric Education Class Meeting: Weekly Feedback Informal Lunch with Faculty
Session III 1:00 - 4:30	C: Dr. Mel Kaufman Topic: Speech and Language	**Methods of Teaching in the Content Areas** FL: Kim Kendall Topic: Developing Strategies for Cultural Understanding M: Dr. Hiram Johnston Topic: Teaching Pre-Algebra Topics S: Dr. Jack Hassard Topic: Strategies and Techniques of Science Teaching	C: Dr. Mel Kaufman Topic: Hearing Impairment	**Methods of Teaching in the Content Areas** FL: Kim Kendall Topic: Microteaching M: Dr. Hiram Johnston Topic: Teaching Algebra Topics S: Dr. Jack Hassard Topic: Planning and Evaluating in Science Teaching	

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Week 5---July 17 - 21

	Monday	Tuesday	Wednesday	Thursday	Friday
Session I 8:30 - 10:15	C: Dr. Jack Hassard Topic: Guidelines to Effective Classroom Management	Guest Speaker: Dr. Lucretia Payton, Georgia State Topic: Teaching Strategies and Techniques in Multi-cultural Environments, Part II	Peer Teaching	Peer Teaching	Guest Speaker: Anne Hightower Coordinator of Staff Development DeKalb County Schools Topic: Designing a Grading System for Secondary School Students
Session II 10:30 - 12		C: Dr. Parker Blount Topic: Foxfire Presentation	Peer Teaching	C: Dr. Parker Blount Topic: Foxfire Presentation	Class Meeting: Weekly Feedback Informal Lunch with Faculty
Session III 1:00 - 4:30	C: Dr. Mel Kaufman Topic: Learning Disabilities; Behavior Disorders	**Methods of Teaching in the Content Areas** FL: Kim Kendall Topic: Microteaching M: Dr. Hiram Johnston Topic: Teaching Geometry Topics S: Dr. Jack Hassard Topic: Computers and Other Technologies in Science Teaching	C: Dr. Mel Kaufman Topic: Structure and Classrom Management	**Methods of Teaching in the Content Areas** FL: Kim Kendall Topic: Discussion of Lesson Plans; Summarization of Course Content M: Dr. Hiram Johnston Topic: Technology and Media for Teaching Mathematics S: Dr. Jack Hassard Topic: Science Curriculum: Science, Technology and Social Issues and Avant garde Projects	

Week 6---July 24 - 28 at *North Georgia College*

	Monday	Tuesday	Wednesday	Thursday	Friday
Session I 8:00 - 10:00	Orientation Session • Overview of the Week • Icebreaker Activity	Peer Teaching GSU Intern will present a thirty minute lesson from his/her mini-unit to a group of peers. Each lesson will be video taped for later analysis in the afternoon.	Peer Teaching	Peer Teaching	Peer Teaching
Session II 10:15 - 12	Overview of the Research on Becoming a Teacher	Guest Speaker	Guest Speaker	Guest Speaker	Closing Session • Review of the Week • Looking Ahead • Graduation
Session III 1:00 - 3:00	Guest Speaker: Andrew W. Henderson, Principal Lincoln County High School Topic: Managing a School of Excellence	Experiences of first-year interns and mentors presented by participants in the 1988 Institute	Curriculum Groups & Special Topics: • Foreign Language • Mathematics • Science	Curriculum Groups & Special Topics: • Foreign Language • Mathematics • Science	
Session IV 3:15 - 5:00	Planning and Preparation for Teaching	• Planning and Preparation • Interns who presented in the morning will watch and critique their lessons using reflective teaching, and effective teaching processes.	Planning, Preparation and Video Tape Analysis	Planning, Preparation and Video Tape Analysis	

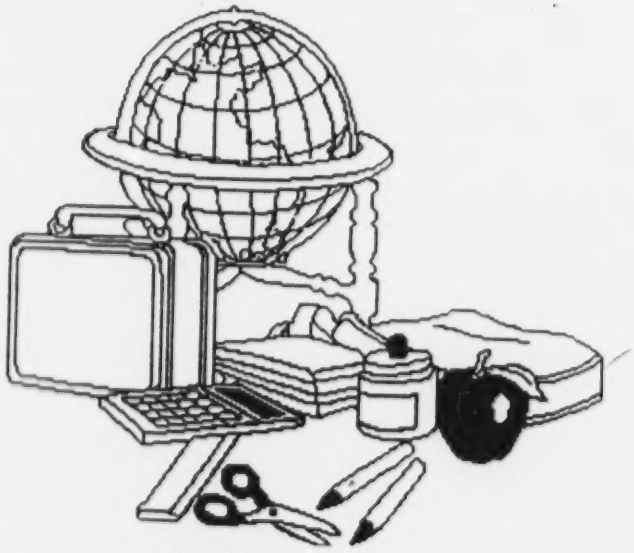
Special Note: We will arrive at the North Georgia Campus late Sunday afternoon, July 23. Departure on Friday

Sample Course Syllabi

EDCI 450
Clinical Teaching

Syllabus

Summer Quarter, 1991



Instructors:

Dr. Jack Hassard
Department of Curriculum and Instruction
Georgia State University

and

Mrs. Marjorie D'Olivo
Science Department
Southwest DeKalb High School

EDCI 450

Clinical Teaching

Summer Quarter, 1991

Meetings: Monday and Wednesday
296 Kell Hall
8:00 A.M - 11:30 A.M.

OBJECTIVES

1. Plan, teach, and participate in lessons in reflective teaching sessions in a laboratory setting.

2. Observe and discuss the management and instructional strategies of teachers in a high school.

3. Design and field test tutorial, small group or large group lessons in a secondary school.

4. Design a mathematics or science mini-teaching module and field test it in a peer teaching environment.

5. Develop and explain a philosophy of teaching that has both theoretical and experiential underpinnings.

6. Develop a model and a plan to manage a secondary school classroom.

7. Demonstrate an understanding of the research findings related to effective teaching.

AGENDA

June 19	Introduction to Clinical Teaching Examination of the syllabus Getting acquainted; effective teaching behaviors Introduction to reflective teaching (Read RT Booklet)
June 24	Reflective Teaching Rounds 1 & 2 Introduction to Direct Instruction (Ch. 10)
June 26	Reflective Teaching Round 3 - 5 Introduction to Classroom Management (Chs. 4-6) Video: Effective Management for Positive Achievement
July 1	Mini-Module Planning Session (Chs. 7-9)
July 3	Classroom Management: Assertive Discipline (Chs.4-6) Video: Creating a Positive Classroom Atmosphere
July 8	Cooperative Learning (Ch. 11) Mini-Module Planning Session
July 11	More on Cooperative Learning Video: Guidelines to Effective Classroom Management
July 15	School Project: Shamrock High School
July 17	School Project: Shamrock High School
July 22	Peer Teaching Sessions
July 24	Peer Teaching Sessions

EXPECTANCIES

A. Reflective Teaching Critiques

Write a one to two page critique of your personal experience in the reflective teaching sessions. Your critiques could address some of these questions; however, please feel free to develop your own narrative.

1. What did you learn about your own teaching strengths through the process?
2. What teaching behaviors did you find most effective for you during your teaching episode? How do these behaviors compare to the characteristics of successful teachers identified by Clark and Starr on pages 18-19?
3. Did you observe effective teacher behaviors when other designated teachers presented their lessons? What were they?
4. Did a model of teaching emerge as a result of your experiences in reflective teaching? If so, describe and illustrate your model of teaching.

Try using the computer in the curriculum lab and Appleworks or some other word processing program for your critique. **Due July 1.**

B. Holistic-Reflective Log

Keep a "holistic - reflective log" in which you make daily entries synthesizing what you learned about teaching as a result of your experiences in the institute. Log entries should be (1) brief---limit each day's entry to no more than two facing pages in your log; (2) verbal (left brain) and/or non-verbal (right brain); (3) made daily for weeks one through six; (4) kept in a separate booklet (that you can buy or make). The log will be a way for your to pull the parts of the institute together in a holistic manner. The log also reinforces the goal to prepare reflective, inquiry-oriented teachers for the secondary classroom. Your log can contain words, pictures, diagrams, photographs, in short, anything that you think will help integrate for you the ideas and activities of the day. **Due July 24.**

C. Readings

Read the following chapters from the following text, and any additional readings that are recommended.

Clark, Leonard H. and Irving S. Starr, (1991). Secondary and Middle School Teaching Methods. New York: Macmillan. Chapters 1-3; 4-6; 7-9; 10 & 11.

Prepare an annotated list of your readings, and a concept map of one chapter of your choice. Annotations should identify the main theme of the chapter. **Due July 24.**

D. School Visit Report

Prepare a report of the four-day visit you will make to Shamrock High School. Your report should summarize your impressions of the visit, and include the observations that you made. Your report should include "maps" of the classrooms you visited, a description of the teaching techniques and strategies used by the teachers, and a summary of your "child study." You should select two students, (for instance, a boy and girl, or an active and a passive student) and observe their behavior and activity for at least two days. Also include a brief synopsis of each day focusing especially on what you did, e.g. if you tutored students, tell what you did and your results; if you taught a lesson, include a copy of your lesson plan, and a self-evaluation of the lesson.

In summary, the school visit report should include:

1. "Maps" of the classrooms you visit.
2. Description of teaching techniques observed.
3. Child study report
4. Synopsis for each day
5. Any lessons plans

The school visit report should be turned in on July 24.

E. Mathematics or Science Mini-Teaching Module

Develop a mini-mathematics or science teaching module consisting of three lessons, plus a pre and post test, and containing pertinent ancillary materials. The lessons in your module should reflect an active and experiential philosophy of mathematics or science teaching. The lessons should reflect you knowledge of models of teaching (direct instruction, cooperative learning, inquiry, conceptual change teaching), and various strategies of teaching (questioning, discussion, drama, video, microcomputers, visuals, tactiles, etc.). The lesson plans should contain objectives, teaching

procedures, materials, and evaluation procedures. In summary you mini-module should be organized as follows:

1. Title of the Module (Pizzazz is ok)---make a title page including the title of the module, your name, subject, and grade in which the mini-module would be used.
2. Rationale for the module---why teach this stuff to kids. What are your reasons. Why should students know this?
3. Pre-Test
4. The Lessons --in sequence, each with a title, objectives, procedures, materials, and evaluation procedures.
5. Post-Test
6. Appendix--containing handouts, quizzes, labs, etc.

Mini-units are due July 22.

Note: If the project is funded, the modules will be "published" and distributed as a package of mathematics and science teaching modules to all members of the clinical class.

F. Peer Teaching

During the week of July 22, you will teach one lesson from your mini-module to a group of peers. The lesson will be video taped, and critiqued.

G. Participation

Participate in all activities of the course.

H. Attendance

Maintain a high level of attendance.

EVALUATION AND GRADING

Evaluation will be based on your performance on the expectancies listed above. Your grade will be based on the following:

1. Critique of reflective teaching	20
2. Holistic-reflective log	40
3. Reading list	30
4. School visit report	40
5. Mini-Module	50
6. Participation and Attendance (3 pts per day)	33

Grading will be as follows:

A	> 185
B	165 - 184
C	145 - 164
D	125 - 144
F	< 125

Lesson Plans:
Reflective Teaching, Microteaching, Instruction, and Microcomputers

Alternative Certification Institute Lesson Plans

Topic/objectives	Procedures	Materials
Reflective Teaching: Lesson 1 June 21	Teacher shows students an overhead slide of alternative types of laboratory experiences used in teacher training programs. The types include microteaching; reflective teaching and simulations. Teacher explains that we will be utilizing at the beginning of the institute, reflective teaching; later in the course we will work with micro-teaching.	
1. to describe the nature of reflective teaching as used in a teacher training program.	Teacher asks students if they have had any formal teaching experience: What kinds of experiences? How did you feel about teaching? Did your students learn? Teacher explains that we will see a video tape that describes the nature of reflective teaching. After the video tape teacher explains that the class will be divided into teams of 4 students. On the following dates we will be engaged in a series of reflective teaching rounds: June 24 June 28 At each reflective teaching round, one person will be the designated teacher (DT), and the others in the small group will be learners. Teacher divides the class into teams (not by subject matter), and identifies the designated teachers for June 24. Teacher gives the DTs lesson plans which they will use during the reflective teaching session. Teacher meets with the DT s for round one and explains the process; teacher repeats the process for DTs for round two.	Video tape on reflective teaching VCR

Human Growth & Development & the the Formation of Foxfire Groups

Teacher keeps class in groups, and explains that each group will be involved in a project to learn about an aspect of human growth and development. Procedurally, each team will be an expert group, and will be responsible for teaching the whole class about one topic on human growth and development. Each team will become a Foxfire group (the term Foxfire has been used because it is reflective of a form of education developed by Eliot Wigginton in which the learner is an active learner).

The topics for the Foxfire groups include:

1. physical development of adolescents
2. personality development of adolescents
3. social development of adolescents
4. Cognitive development of adolescents
5. Moral development of adolescents
6. Adolescent sexuality
7.

Teacher discusses the process with the groups. In general it is expected that each group's presentation will utilize effective teaching strategies: lecture, inquiry, small group work, use of visual aids, interactive teaching. Since the groups will have 3-4 hours to present, a lecture is not the most appropriate form of a presentation. In the spirit of Foxfire, groups will be encouraged to be original, and creative in their presentations.

Reflective Teaching
Lesson 2
June 23
2. participate either as designated teacher or learner in a series of reflective teaching rounds.

Teacher explains the process to the class for reflective teaching round:

1. Class divides into reflective teaching groups.
2. DT teaches lesson (which will last no longer than 15 minutes).
3. DT administers cognitive test.
4. DT collects tests, and administers learner satisfaction forms. During this time, DT scores tests.
5. DT facilitates a 5 minute "reflective session." At this session the DT uses several questions to lead the discussion.

Samples questions for DT include:

- What knowledge, skills, or attitudes were you hoping to to develop in your learners? To what extent were you successful in your effort? What do your learners think?
- In planning for your RTL, what influenced you most? Did the following have any effect on your instructional ideas?
  a. your knowledge of subject and teaching.
  b. your attitudes and values about teaching and learning.
  c. materials available to you.
- In developing your instructional ideas how did you go about:
  a. building your ideas into a teaching method?
  b. deciding whether or not the method you had in mind would work?
  c. modifying your ideas into a final teaching method?
- What is the reaction of learners to the teaching method used?

6. Instructor brings all the groups together for a 10 minute large group "reflective session," to explore the experience, and develop some generalized concepts.

Sample questions for large group discussion:

- How did you go about teaching the RTL? Describe briefly how and why you taught your lesson as you did.
- How successful was your methodology in bringing about learning and satisfaction?
- What was your teacher like or what did your teacher do that you believe contributed to learning and satisfaction? What could your teacher have done that probably would have caused increased learning and satisfaction?
- What did you learn or rediscover about teaching and learning?
- What did you learn about your strengths and weaknesses as teachers?
- Do you believe you changed any of your ideas about teaching or attitudes toward teaching? If so, which ones.
- What do you believe makes a teacher effective?

Class is divided into reflective teaching groups, and carries out round one of reflective teaching.

A short break is taken before round two begins.

After round two, the instructor identifies the designated teachers for the next round of reflective teaching to be carried out on June 28.

Inside a High School Classroom

Teacher reminds students that they soon will be visiting a high school and that today we will spend a little time watching a video tape of a teacher working with secondary students.

Teacher shows a video tape of a high school class, and asks students to record what they see happening. No specific directions are given; students are free write what ever they wish.

After the video (about 5 minutes in length), the teacher asks the students to report their observations to the whole class; a list is made on chart paper. Teacher asks:

- What was the predominate teacher behavior?
- What was the predominate student behavior?

Teacher indicates that they will observe the same tape again, but this

time the students will be asked to "look" for certain teacher and student behaviors:

- movement of the teacher; the students
- number and types of questions the teacher asks
- how often, and the nature of student talk
- instances of teacher "disciplinary" behavior
- nature of the dialog in the classroom; what did the teacher say; the students.

After the video, teacher asks various students to report their observations. How was the observation of the classroom the second time (in a more structured fashion), different than the more open-ended approach?

Reflective Teaching: Lesson 3
June 28

Teacher divides the class into reflective teaching groups, and gets the class started on a round of reflective teaching.

Class repeats another round of reflective teaching.

3. reflect, or thoughtfully analyze upon the Reflective Teaching Lessons

Teacher leads a class discussion on the reflective teaching sessions:
What was learned?
How do you feel about teaching now?
What are some areas that need our attention?
What can we learn about teaching from teaching?

Remainder of the morning is spent with Ed Davis.

Using Microcomputers and other Technologies in the Classroom
June 30

1. identify how computers and other technologies should be used in the school curriculum	Teacher introduces the use of computers and other technologies by facilitating a discussion on the philosophy of computer usage, and other technologies. Focus is directed at 1. learning **with** technology (microcomputers), and 2. learning **about** technology (microcomputers.	
2. describe how a software program can be used to facilitate the learning of content objectives, e.g. learning **with** technology	Teacher introduces the class to a software program called Maps and Navigation. Teacher shows the class the components of the program, and discusses how this program could be used in a science, mathematics, social studies, or language class. Teacher selects one of the games, Pirate's Gold, and involves the class in this simulation activity.	Maps and Navigation software
3. describe how computer activities could be used in the general curriculum	Teacher organizes the class into groups of 4, and asks them to examine a list of objectives that might be found in a school's curriculum, and a list of fictitious computer activities. Teacher asks groups to fill in a third chart, (a matrix of the objectives, and computer activities. When the groups are finished (after 5 minutes), teacher asks one group to discuss how they matched computer activities for the first 3 or 4 objectives. Teacher facilitates discussion on degree of agreement or disagreement.	
4. describe how technologies (microcomputers, print, and TV) can be integrated to enhance learning	Teacher suggests that technologies should be used as tools to aid teachers and students. Further, different technologies can be used to help achieve different goals. To demonstrate this, teacher introduces the class to a curriculum called, The Voyage of the Mimi. Teacher shows the class a video tape which shows how technologies can be integrated to enhance student interest, motivation and learning.	

5. describe activities that can be used to help teachers and students learn about (microcomputers)	Activities can be incorporated into the curriculum to help students learn about computers. Learning how to program is one example. To demonstrate this objective, teacher selects another software program from the Voyage of the Mimi, Introduction to Computing. Teacher selects the activity: Whale Search. Whale Search is a game which utilizes the logo language. In this way, students at a very young age can learn to program a computer.	Logo
	Teacher mentions that logo was invented at MIT by Semour Papert. Teacher makes comments about Papert's philosophy, and how the "logo environment" can stimulate creative and critical thinking among students.	Papert's book: *Mindstorms*
	Teacher demonstrates the use of whale search.	
6. describe objectives, and possible activities that would help achieve "computer literacy" among students.	Teacher shows the class a slide that proposes a definition of computer literacy: Sample components How to operate it How to communicate with it How to use it as problem-solving tool How it affects society	Literacy slide
	Teacher shows students another slide that proposes how these literacy goals might be integrated into the curriculum.	Curriculum slides
	Teacher shows another slide that suggests how literacy goals might be integrated into individual subject areas.	
7. describe how the computer could be used as a tool for the teacher	Teacher introduces the class to a software package called Appleworks. Its an integrated package (word processing, data base, and spread sheet). Teacher briefly demonstrates the word processing program, and the data base.	
	Teacher introduces a second program, Bank Street Writer Plus, and demonstrates its use very briefly.	
	Teacher suggests that each students become familiar with one of these programs this summer.	
8. describe classroom arrangements and skills needed to use microcomputers.	Teacher shows maps of classrooms utilizing o. 1 or many computers.	
	Teacher shows class a list of skills needed by the classroom teacher to use computers effectively.	

83

Communication and Effective Teaching: Microteaching
July 7

1. identify communication skills that are associated with effective classroom teaching, e.g. instructional set, varying the stimulus situation, illustrating and use of examples, asking questions, reinforcement, and closure.

2. relate communication skills to various models of teaching, e.g. direct instruction, inquiry teaching, conceptual change teaching, cooperative small group learning.

3. demonstrate the use of communication skills in a microteaching situation.

Teacher briefly explains that the class will find out about communication skills by working in small cooperative (expert) teams, studying a specific skill, planning a 5 minute lesson emphasizing that skill, and then using the lesson to teach others about the communication skill.

Teacher shows the class a slide that lists the microteaching communication skills, and relates them to the direct model of teaching.

Teacher makes brief comments about each skill:

- instructional set
- varying stimulus situation
- illustration and use of examples
- asking questions
- reinforcement
- closure

Teacher divides class into six groups; each group will study one of the communication skills. The group should study the material in the microteaching booklet. Using this material, they should plan a presentation for the whole class that includes:

- information about the skill
- how the skills help with communication
- a five minute lesson demonstrating the use of the skill in a subject matter lesson, e.g. math, science, foreign language

Skillbooklets
Microteaching

Groups will have one hour to study and prepare their lesson.

Successive groups will present their group's skill. At the end of each session, teacher will help facilitate a discussion about the skill.

A Course in Science Teaching: The Olympia Edition

Syllabus, Student Version
Secondary Science Methods

Jack Hassard, Ph.D.
Georgia State University

The Course At A Glance

June 21	An inquiry into science teaching
June 23	How adolescents learn science
June 28	Philosophy, goals and objectives of science teaching
June 30	Models of science teaching
July 5	Guest presentors: science educators talk about science teaching
July 7	Strategies and techniques of science teaching
July 12	Planning and evaluating in science teaching & managing the science classroom
July 14	Microteaching
July 21	Computers and other technologies in science teaching/ and science curriculum: science, technology & social issues and avant-garde projects
July 26	Continuation of computers and science curriculum issues
July 28	Open

A Course in Science Teaching: The Olympia Edition
Course Outline

Date	Workshop Theme	Objectives	Tentative Agenda
6/21	**An Inquiry into Science Teaching**	1. Demonstrate how to use "thinkers" (discrepant events) to stimulate inquiry. 2. Demonstrate a method for starting a class session or a course. 3. Compare and contrast the nature, characteristics, and factors affecting motivation of scientists and secondary students. 4. Arrive at an operant philosophy for the use of hands-on science (DI 2) 5. Analyze statements about the nature of science and evaluate their relationship to science. 6. Identify insights or learning from the day's session.	Pennies from... Mystery object Draw a scientist Scientists vs adolescents Footprints Nature of science Journal Readings: Trowbridge, Ch. 1 & pp. 38-40 C.P. Snow, The Two Cultures Bronowski, Science & Human Values
6/23	**How Adolescents learn Science**	7. Describe conceptual change teaching, both its theory and practical application. 8. Apply conceptual change teaching to an other area of science teaching. 9. Describe a general framework for helping students "really" understand science concepts. 10. Describe thinking patterns of students. 11. Compare and contrast concrete and formal thinking. 12. Predict implications of students' reasoning patterns on methods of teaching. 13. Describe learning style characteristics of the 4MAT system. 14. Apply the 4MAT system to a science teaching	Thinker--ice cubes Conceptual change teaching: Batteries, BW Lookout mountain? Conceptual change framework Mr. Short and the mealworms: The thinking adolescent Learning styles: 4 MAT It's Dunn Journal Readings: Trowbridge, pp. 73-83

Date	Workshop Theme	Objectives	Tentative Agenda
		situation.	Osborne, pp. 1-80; 101-111
6/28	**Philosophy, goals and objectives of Science Teaching**	15. Given a historical setting, describe the major elements of a science course. 16. Identify the Project Synthesis goal areas. 17. Apply the "science as inquiry" subthemes to science teaching situations. 18. Differentiate and use basic science process skills and integrated science skills. 19. Apply strategies of inquiry in a science teaching situation. 20. Prepare a mini-inquiry lesson which focuses on inquiry, and includes objectives, teaching procedures, and materials.	Thinker: Strips Prehistoric, contemporary and future science courses Goals for Science teaching: •Project Synthesis •Inquiry Processes of Science •The Candle •Mystery boxes •Marbles Challenge of the Unknown: Episode 1: Situation Journal Readings: Trowbridge, Ch. 7 & 16 Fenshaw, Science for All, Educational Leadership, Jan 87
6/30	**Models of Science Teaching**	21. Demonstrates a watch-doing delivery scheme--inquiry (DI 7) 22. Apply the direct/interactive teaching model to a science teaching lesson. 23. Apply inquiry teaching models to science teaching situations. 24. Analyze an inquiry lesson. 25. Compare scientific inquiry to problem solving. 26. Demonstrate and analyze cooperative learning teaching models. 27. Describe the elements of Co-Op Co-Op.	Thinker: The Potato and Straw Rounds of inquiry teaching Science Teaching Models: •Direct Teaching: example from Junior high science textbook •Inquiry Teaching: Demonstration lesson from GEMS--Paper Towel: •Problem Solving: Challenge of the Unknown: Information •Cooperative Learning: Survival on the Moon Video on Co-op Co-op

Date	Workshop Theme	Objectives	Tentative Agenda
7/5	**Science Educators Talk About Science Teaching**	28. Explore the nature of secondary science teaching from the perspective of practicing science educators	•Teaching Science in Middle/Junior Highs: Mary Wilde, Booth Junior High Peachtree City •Teaching Science in a High School: Pat Sharpton, Gwinnett Schools •Current Issues and Future Trends in the Teaching of Secondary School Science: Linda Mitchell, Coordinator of Science, Gwinnett Schools
7/7	**Strategies and Techniques of Science Teaching**	29. Identify clusters of strategies and techniques of teaching. 30. Demonstrate listening-speaking delivery schemes (DI 5) 31. Describe the effect of "wait-time" and other questioning techniques on student thinking 32. Demonstrate how discussions and debates contribute to inquiry. 33. Demonstrate alternative reading-writing delivery schemes (DI 6)	Thinker: Loftus Needle and Balloon Brainstorm strategies Categories of Strategies The Teacher Questioned? •Video Analysis and Classifying •Wait a minute! Creating controversy Helping Students in Science •Study Skills •Vocabulary •Reading Challenge Journal Readings: Trowbridge, Ch. 11 NSTA/NASSP, Science Study Skills Booklet

Date	Workshop Theme	Objectives	Tentative Agenda
7/12	**Planning and Evaluating in Science Teaching & Managing the Science Classroom**	34. Analyze lesson plans in terms of the following objectives and criteria: • plans include a rationale based on a philosophy of science education. • plans are related to a model of instruction, e.g. direct teaching, inquiry teaching, cooperative learning, conceptual teaching. • Plans contain objectives written in performance terms, incorporate higher level thinking skills, and/or affective thinking. • plans contain activities related to objectives and reflect a hands-on philosophy. • plans contain specific resources, materials and references. • plans indicate how student learning will be evaluated. 35. Discuss the elements of a science unit of instruction. 36. Explore the nature of student evaluation. 37. Explore methods of evaluating student progress in science. 38. Write assessment items that are based on an analysis of content, and the domains of learning. 39. Demonstrate effective classroom procedures for a hands-on science program. 40. Organize instructional time in ways that facilitate student learning (MC 13) 41. Provide appropriate directions for instruction and classroom management (MC 10) 42. Clearly organize the routines for the use of materials and make these routines public (MC 12)	Thinker: The Water glass Lesson Planning •Bring a plan to class •Small group analysis Evaluating Student Progress Test Construction Workshop •Pre-tests •Unit tests •Diagnostic tests Hands-on Science without Insanity Demonstration lesson: Building an astrolabe Challenge Journal Readings: Trowbridge, Ch. 18 & 20
7/14	**Microteaching**		

Date	Workshop Theme	Objectives	Tentative Agenda
7/21	**Computers and other Technologies in Science Teaching**	43. Distinguish among five uses of the computer in science teaching. 44. Explore uses of computers for classroom science instruction. 45. Describe ways in which the microcomputer can enhance writing and record keeping in the science classroom. 46. Describe examples of how the computer can be integrated with other technologies, such as with Video/TV	Thinker: The Pendulum Using Computers in Science Education • Tutorials and Drills • Simulations and Games • The Computer as Tool • For Writing and Record keeping Combining Technologies • VOM Journal Readings: Trowbridge, Ch. 10 Abruscato, Children, Computers & Science Teaching Harvard EdTech Materials
7/26	**Science Curriculum: Science, Technology & Social Issues & Avant-garde Projects**	47. Identify the importance of science and society issues in the science classroom. 48. Describe strategies for teaching STS issues in the classroom. 49. Demonstrate the use of an STS lesson in a science course. 50. Describe the goals and objectives of a science course focused on science society issues. 51. Describe several pioneering science curriculum projects.	Thinker: Dots GAIA Why Science & Society? The Science Times VC & Moral dilemmas Global Issues in Science Teaching 5's Walk on Thursday Avant-garde Projects: • Project Learning Tree • Project Wild • Harvard Ed Tech Programs • NSTA Focus on Excellence Readings: Trowbridge, Ch. 16 Exeter II Conference: Science and Technol
7/28	**Open**		

EDSC 457: Methods and Materials of Science
References, Learning Tasks and Learning Agreement
Summer Quarter

References

Books

*Trowbridge, Leslie and Rodger Bybee. *Becoming a Secondary Science Teacher*. Columbus, Ohio: C. Merrill, 1986

*Osborne, Roger and Peter Freyberg. *Learning in Science*. Auckland: Heinemann, 1985

Abruscato, Joe and Jack Hassard. *The Whole Cosmos Catalog of Science Activities*. Glenview, Il. Scott, Foreman, 1978

Abruscato, Joseph. Children, Computers, and Science Teaching. Englewood Cliffs, N.J.: Prentice-Hall, 1986

Bronowski, J. *Science and Human Values*. New York: Harper and Row, 1956.

Bybee, Rodger, Janet Carlson, and Alan McCormack. *Redesigning Science and Technology Education*. Washington, 1984

Bulman, Lesley. *Teaching Language and Study Skills in Secondary Science*. London: Heinemann, 1985.

Dunn, Rita and Kenneth Dunn. *Teaching Students Through Their Individual Learning Styles: a Practical Approach*. Reston, VA: Reston Publishing Co. 1978.

Focus on Excellence Series. Washington, D.C. NSTA

- *Science as Inquiry*, John Penick, ed. 1983
- *Biology*, John Penick and Ronald Bonnstetter, eds., 1983
- *Physics*, John Penick, ed. 1984
- *Middle School/Junior High Science*, John Penick and Joseph Krajcik, eds. 1985
- *Physical Science*, John Penick and Vincent Lunetta, eds., 1984
- *Science/Technology/Society*, John Penick, Richard Meinhard-Pellens, eds., 1984
- *Chemistry*, John Penick and Joseph Krajcik, eds., 1985
- *Earth Science*, John Penick, ed., 1985

Fraser, Sherry, Project Director. *SPACES: Solving Problems of Access to Careers in Engineering and Science*. Palo Alto, CA: Dale Seymour Publications, 1982.

Funk, H. James, et.al. *Learning Science Process Skills*. Dubuque, IO: Kendall/Hunt Publishing, 1979.

GEMS (Great Explorations in Math and Science) Units, Lawrence Hall of Science, University of California, Berkeley:

- Animals in Action
- Chemical Reactions
- Discovering Density
- Magnifiers
- Mapping Animal Movements
- Paper Towel Testing
- Quadice

Hassard, Jack. *Adventures in Geology*. Decatur, GA: Northington-Hearn. 1988.
Hassard, Jack. *Science Experiences: Cooperative Learning and Science Teaching*. Menlo Park, CA: Addison-Wesley Publishing Company (in press).
Hoffman, Helenmarie H. and Kenneth S. Ricker. *Science Education and the Physically Handicapped*. Washinton, NSTA, 1979.
Judson, Horace Freeland. *The Search for Solutions*. New York: Holt, Rinehart and Winston, 1980.
Making Sense of the Future: A Position Paper on the role of Technology in Science, Mathematics, and Computing Education. Cambridge, MA. Harvard Educational Technology Center, 1988
Mallow, Jeffry V. *Science Anxiety: Fear of Science and How to Overcome It*. New York: Thomond Press, 1981.
Morrison, Philip and Phylis. *The Ring of Truth: An Inquiry into How We Know What We Know*. New York: Random House, 1987.
NOVA: Adventures in Science. WGBH Boston. Reading, MA: Addison-Wesley, 1983.
Padilla, Michael J. *Science and the Early Adolescent*. Washinton, D.C. NSTA, 1983.
Peterson, Rita, et.al. *Science and Society: A Sourcebook for Elementary and Junior High School Teachers*. Columbus, OH: Charles Merrill Publishing Company, 1984.
Romey, William D. *Teaching the Gifted and Talented in the Science Classroom*. Washington, D.C. NEA, 1988.
Samples, Bob, Bill Hammond and Bernice McCarthy. *4MAT and Science: Toward Wholeness in Science Education*. Barrington, IL: Excel, Inc. 1985
Science Fair Projects, K-8. Washington: NSTA, 1988.
Science Fair Projects, 7-12. Washington: NSTA, 1988
Showalter, Victor M. *Conditions for Good Science Teaching*. Washinton, D.C. NSTA, 1984.
Skolnik, Joan, Carol Langbort, and Lucille Day. *How to Encourage Girls in Math & Science*. Engelwood Cliffs, NJ: Prentice-Hall, Inc. 1982.
Streiber, Whitley. *Wolf of Shadows*. San Francisco: Sierra Club Books, 1985 (A younger readers book?)
Stronck, David R. *Discussing Sex in the Classroom: Readings for Teachers*. Washington: NSTA, 1982.
Strongin, Herb. *Science on a Shoestring*. Menlo Park, CA: Addison-Wesley Publishing Company, 1976.
Sutman, Francis X, Virginia French Allen, and Francis Shoemaker. *Learning English Through Science*. Washinton: NSTA, 1986.

Journals:

American Biology Teacher
Journal of Earth Science Teaching
Journal of Chemical Education
Journal of Research in Science Teaching
School Science and Mathematics
Science and Children
Science Education
The Physics Teacher
The Science Teacher

Videos:

Challenge of the Unknown
The Ascent of Man
The Search for Solutions
Voyage of the Mimi

Learning Tasks

Science Teaching Unit

Develop a science unit consisting of five lessons, plus a pre- and post- test, and containing any ancillary materials. The lessons in your unit should reflect a hands-on and inquiry oriented philosophy of science teaching. The lessons should reflect your knowledge of models of science teaching (direct teaching model, inquiry models, conceptual change teaching, cooperative learning, etc.) and various strategies of teaching (questioning, discussion, drama, films, video, visuals, tactiles, etc.). The unit should be prepared along TPAI guidelines. The actual form of the lesson plans is up to you; however each plan should contain objectives, teaching procedures, science teaching materials, and evaluation procedures. In summary your unit should be organized as follows:

Title of the Unit
Description of the Students (See TPAI booklet)
Rationale for this unit
Pre-Test
Lessons
Post-Test
Appendix (containing handouts, quizzes, labs, etc.)

Reflective Teaching Journal/log

The purpose of the Reflective Teaching Journal is to encourage you to reflect upon what you are learning about science teaching in this course. One entry in your Journal should be made for each class session. The entry should not be lengthy; brevity is a virtue. You might consider the following questions as possible directions to take in formulating the nature of your Journal:

- What did I learn today about secondary school science teaching?
- What does it take to be a good science teacher?
- Did the content of today's session synchronize with your philosophy of science teaching?
- What did you learn about American science education today?
- Did you agree with what happened, or what was said today?
- What did you learn that surprized you? Pleased, angered, reminded you of something...

Your Journal should be a stand alone booklet which can be a commercial or hand-made production.

Think Pieces

A think piece is a verbal or visual analysis or synthesis of some aspect of what you are learning about science teaching. If you use words, the think piece should be limited to 1500 bits; if your think piece is a visual, limit yourself to a poster size product. Here are some sample think piece topics: (Please do not limit yourself to these)

- What is conceptual change teaching?
- How do you know if a student understands electricity (or gravity, density, meiosis)?
- Should values be taught in the science curriculum?
- What is the difference between a "concrete" thinker and "formal" thinker?
- How important should the processes of science be in the secondary school science curriculum?
- What do you consider to be the qualities of an effective science teaching lesson?
- What is inquiry teaching?
- What are some global science topics that might be included in a high school chemistry course (or biology, physics, or earth-science)? Why?
- How can a teacher's questioning strategies affect the intellectual climate of a science classroom?
- How can newspaper headlines, stories and reports be used to teach science?
- What would you do if you had a student in your 10th grade biology course who couldn't read? (Sorry, he/she must stay in this section of biology.)
- How can technology be used to improve science teaching?

Exciting Examples, Everyday Phenomena (EEEP)

This is a grown-up version of show-and-tell. Remember. In this version, I'd like you once during the course to bring in an example of an everyday phenomenon, in the form of an object, artifact, machine, photograph, piece of technology, or what ever, that you could use to illustrate an idea in science. Suggest (on a card) how it might be used. Get us involved in your phenomenon. If and when you do this, set it up at the beginning (before) of class, and place it in a prominent place in the classroom.

Readings

Read what you want in this course. There are two "required" texts---Trowbridge and Osborne--but there is a lot of other interesting material to read and look at. In this learning task, your product is simply a typed list of your readings that you did for the course. Most of the references that are listed on pages 7 and 8 are on reserve for your use in the Curriculum Laboratory of the College of Education located in room 420 N. Pullen Library.

Educational Software

Another learning task to choose from is becoming familiar with software for the science classroom. Software will be made available to you during the course. It can be previewed and used in room 638 Urban Life (C&I microcomputer laboratory). You will need to check with Carolyn McGee (Curriculum and Instruction departmental secretary) to get in the room, and use the software. A variety of software will be made available including word processing programs, graphics programs, simulations and games, test banks, and tutorials. Your product is a list of the software you examined, and one or two sentence evaluation or reaction to the software.

Learning Agreement

In this course, I am asking each student to choose from among several learning agreements. These agreements are like contracts, and they will be used to determine a grade for your participation in this course. Please select from among the following agreements, and turn in a card with your name, and the learning agreement you have chosen.

85

Learning Agreement # 1 (Grade A)

The learner agrees to do the following learning tasks:

- Develop a Science Teaching unit
- Reflective Teaching Journal
- Choose two: EEEP, Think Piece, Educational Software
- Readings
- Participate in micro-teaching
- Have satisfactory attendance
- Participate in class activities

Learning Agreement # 2 (Grade B)

The learner agrees to do the following learning tasks:

- Develop a Science Teaching unit
- Reflective Teaching Journal
- Choose one: EEEP, Think Piece, Educational Software
- Readings

- Participate in micro-teaching
- Have satisfactory attendance
- Participate in class activities

Learning Agreement # 3 (Grade C)

The learner agrees to do the following learning tasks:

- Develop a Science Teaching unit
- Reflective Teaching Journal, Think Piece,EEEP, or Educational Software
- Readings
- Participate in micro-teaching
- Have satisfactory attendance
- Participate in class activities

Learning Agreement # 4 (Grade D and/or F)

The learner fails to complete the agreement stated in Learning agreement # 3.

Fulfilling the Learning Agreement

The products that you create will be due at different times during the quarter. EEEP and Think Pieces can be completed anytime during the quarter. The Reflective Teaching Journal is due the last day of class, as well as reading, and/or educational software lists. The Science Teaching Unit is due July 14th.

At the end of the course, you should make up a form which lists each of the items that you have agreed to complete. For each item, please write a brief assessment of your accomplishments. This should be turned in on the last day of class, accompanied by any products due that day.

A Course in Science Teaching: The Olympia Edition

Syllabus, Instructor's Version
Secondary Science Methods

Jack Hassard, Ph.D.
Georgia State University

The Course At A Glance

Workshop 1	An inquiry into science teaching
Workshop 2	How adolescents learn science
Workshop 3	Philosophy, goals and objectives of science teaching
Workshop 4	Models of science teaching
Workshop 5	Science educators talk about science teaching
Workshop 6	Strategies and techniques of science teaching
Workshop 7	Planning and evaluating in science teaching & managing the science classroom
Workshop 8	Computers and other technologies in science teaching
Workshop 9	Science curriculum: science, technology & social issues and avant-garde projects

A COURSE IN SCIENCE TEACHING: THE OLYMPIA EDITION

Workshop 1: An Inquiry into Science Teaching

Goals and Objectives	Procedures	Materials	Evaluation
Science as Inquiry			
1. Demonstrate how to use "Thinkers" (discrepant events) to stimulate inquiry	• Instructor challenges class to estimate how many pennies can be put into a glass full of water. Estimates are recorded on the board. Instructor proceeds to put pennies into the glass. Students discover that the glass can hold 25 or more pennies without water spilling. Instructor asks students to "theorize" by having students a) verbally give explanations, b) draw pictures to explain their idea. Instructor explains that on most session, class will begin with a "thinker." Instructor introduces the concept of discrepant event and relates it to thinking and motivation in science teaching.	glass, water, pennies	What is a discrepent event?
2. Demonstrate a method for starting a class session or a course.	• Instructor welcomes the students to class, and explains briefly the agenda for the day. • Instructor distributes a mystery object to each student. Mystery objects are placed in students' hands and they are told not to look at them. Instructor asks students to observe the object by writing observations, and by making a drawing of the object. Each student is also given a piece of modeling clay, and is asked to use it to replicate the mystery object. Teacher asks students for observations, and has students compare their models, and drawings with students near-by. Teacher asks students to make inferences: What is it? How old is it? How was it made? Students look at their objects, compare with fellow students,	Flip chart with agenda for the session printed in large letters. mystery object modeling clay geologic map of Georgia	How did the class respond to the activity? What was the level of involvement?

	and revise their earlier hypotheses.		
	• Teacher asks students if they thought this "lesson" was an example of inquiry teaching.	Read pp. 38-40 Trowbridge	
	• Students are invited to make a pendant using their mystery object.	glue string bell caps	Do the teachers understand inquiry and its importance to science teaching?
Course Syllabus/ Agenda	Instructor distributes course syllabus and agenda, goes over the course.	Syllabus	
Scientists and Students: Two Cultures? 3. Compare and contrast nature, characteristics, and factors affecting motivation of scientists and secondary students.	• Teacher asks students to think about their image of a scientist. Students are asked to draw a picture of a scientist, and to show the scientist doing science. Students work in small groups to observe drawings of others, collect data on the characteristics of scientists. Students are asked to formulate questions, or categories in order to collect data. Results are shared with whole class. Teacher leads discussion by asking questions: How many of the scientists are female? What ethnic groups are represented? What science disciplines, e.g. biology, geology, physics?	drawing paper crayons/marking pens	Have any teachers done this with their students? How aware are they of stereotyping?
	• Class is divided into small groups. One set of groups asked to brainstorm an answer to the question: What motivates scientists? Other groups brainstorm: What motivates secondary school students? Groups share results with whole class. (Each group makes a large chart summarizing their groups results. Charts are placed on walls for all to read. Teacher leads class discussion: How do scientists and secondary students compare? Are there two cultures?	Refer class to C.P. Snow's: *Two Cultures*	Check classes awareness of the "two cultures." Can they cite other examples: scientists-humanists;

Inquiry and science teaching 4. Arrive at an operant philosophy for the use of hands-on science (DI 2)	• Teacher leads the class in an activity known as the the "footprint puzzle." Students work in pairs to try to unravel or explain a set of footprints that were made during the Mesozoic Era, probably by dinosaurs. Each team is to generate at least three hypotheses to account for the set of prints. After teams complete their work, each team is invited to report their "favorite" hypothesis. Teams are encouraged to support their hypotheses with data and/or observations.	Copies of footprint map Models of dinosaur prints	scientists-artists
	• Teacher asks how this lesson might have been taught using a more direct approach. (direct teaching, lecture, etc). Teacher asks how the approaches---hands-on and lecture---are different, and the advantages of each.		Can teachers defend using a hands-on approach.
The Nature of Science 5. analyze statements about the nature of science and evaluate their relationship to science.	• Instructor divides the class into groups of four. Each member of a group is given a questionnaire about the "nature of science." Each member rates the statements according to their degree of agreement. Through consensus, the team should categorize each statement into four groups: 1) agree 2) partially agree 3) disagree 4) don't know or no opinion. Team should then analyze the statements in each group, and be prepared to briefly report to the whole class.	Nature of science questionnaire p.47 Trowbridge chart paper	
Journal 6. identify insights or learning from the day's session	• Teacher explains that during the course, students are to keep a science journal. Each session will end with a brief (2 minute) writing session. Today: What insight did you discover about science teaching? or What was the highlight of class for your?	Notebook, or sheet of paper.	

Workshop 2: How Adolescents Learn Science

Goals and Objectives	Procedures	Materials	Evaluation
Thinker for the day	Teacher shows the class two jars, each 1/2 of a clear liquid. Teacher places ice cubes in both glasses; in one the cubes float, in the other they sink. Question: How can you explain these observations? Why do the ice cubes float in one, and sink in the other?	ice cubes water alcohol 2 quart jars	Problem: How can you determine the density of the ice cubes? Make a drawing to show your solution.
Today's Agenda	Reveal agenda for the day by unfolding the chart paper at the front of the room.	chart paper with agenda printed on it	
Helping Students really "understand" science: Conceptual change teaching			
7. Describe conceptual change teaching, both its theory and practical application.	• Teacher presents the class with a problem: Given this baggie containing 2 wires, 1 bulb, and 1 battery, how would join these together to make the bulb light? Teacher asks students individually draw a diagram indicating their solution. Teacher asks students to share their solutions in small groups.	baggie battery 2 pieces of wire bulb	How do student diagrams compare?
	• Teacher introduces the idea of naive theories, or misconceptions in science teaching. Teacher shows on transparencies, drawings made by adolescents when posed the same problem (light bulb).	transparencies of misconceptions	
	• Teacher asks students to identify other "naive theories" that students bring to science. Teacher asks each group to identify three or four concepts and brainstorm to identify some possible misconceptions.	Ref: pp 1-80 Osborne	
	• Teacher asks each group to share their concepts and associated misconceptions.		Do all groups report results?

8. Apply conceptual change teaching to an other area of science teaching.	• Teacher shows students a stratigraphy problem from geology. A cross sectional diagram of a sequence of rock beds that have been subjected to minor folding is presented. Students are asked to determine which of the beds in the sequence is youngest, and to explain why they think so. Students are asked to work in pairs to solve the problem. Teacher then asks pairs to report their conceptions to the class. Teacher uses student ideas as a way to identify misconceptions.	Transparency of cross section.	
	• Teacher asks class how these misconceptions can help in planning future lessons in which the goal is to help students interpret cross sectional diagrams.		To what extent is class able to identify examples?
9. Describe a general framework for helping students "really" understand science concepts	• Teacher asks class to express their ideas about how they would teach to ensure that students understood science concepts. Teacher writes ideas on chart paper. These ideas will be used in the discussion to follow.		
	• Teacher presents a framework developed by Cosgrove and Osborne. Framework includes four phases: 1) preliminary, 2) focus, 3) challenge and 4) application	Ref: pp101-111 Osborne	
	• Teacher asks students to evaluate the framework in light of their own experience.	Teacher refers class to Osborne, chapter 10: unit on teaching elect.	
How students think: A look at cognitive development 10. Describe thinking patterns of students	• Teacher divides class into groups of three. Each team is given a problem to work on; either a) the mealworm puzzle or b) Mr. Short. Students are asked to work on the problem as a team, then to look at responses made by adolescents. Students are asked to analyze the thinking of the	Mealworm puzzle and questions. Mr. Short problem, and questions.	Can class differentiate concrete from formal thinking?

	students by responding to several questions on a hand out.		
11. Compare and contrast concrete and formal thinking.	• Teacher provides teams with information on concrete and formal reasoning patterns. Four concrete and four formal reasoning patterns are identified. Students are asked to analyze the student responses to the Mealworm and Mr. Short puzzles in light of these reasoning patterns. Groups are asked to identify the reasoning patterns of each student used in the puzzles.	Handout: Concrete & formal reasoning patterns Read pp 73-83 Trowbridge	
12. Predict implications of student reasoning patterns on methods of teaching	• Teacher asks class to discuss the difference between concrete and formal thinking patterns. Teacher asks those who have taught students, to comment on the thinking patterns of their students. How do student reasoning patterns affect how and what you will teach?		Do experiences by teachers confirm research by Piaget?
Learning Styles and Science Teaching 13. Describe learning style characteristics of the 4 MAT system	• Teacher introduces the 4 MAT system developed by Bernice McCarthy. Teacher shows graph depicting the four quadrant model of the 4 MAT system. Class is divided into teams, each being given a list of characteristics of learners for one of the quadrants. Teacher asks each group to describe "their learner's style" by listing no more than 10 words. Teacher then asks each group describe their learner. How are these learners different. Draw a picture!	Ref: 4 MAT and Science by Samples, Hammond, and McCarthy	Does the class understand the 4 quadrant system?
14. Applying the 4MAT system to a science teaching situation.	• The 4 MAT system is an integration of of left-right brain research, with the research on learning styles. Teacher will apply the 4 MAT system to teaching by demonstrating mini-lesson plans for a unit on the study of rocks.	Rock samples index cards	
	• Teacher will show a series of slides that	transparencies of the	Can students apply

	divide each of the quadrants into left and right brain modes. Each mode will contain an activity related to the study of rocks.	4 MAT system	the rock unit to other areas of science?
	• Teacher shows a final slide that describes a learning cycle integrating the 4 MAT system. To what extent does the 4 MAT system help teachers deal with the variety of learning styles? Are there other aspects of student learning styles?	transparency of the 4 MAT learning cycle	
Journal	• Teacher asks students to write in their journal for 2 minutes. Suggestion: what did you learn about your own learning style?		

Workshop 3: Philosophy, Goals and Objectives of Science Teaching

Goals and Objectives	Procedures	Materials	Evaluation
Thinker for the Day	• Teacher gives groups of students a cup of water, and 3 strips of paper, each with a black line. Teacher asks students what they think might happen if the strip is held in the water for a few minutes. Students generate predictions, and then test them by placing strips in the water. Teacher asks the students to explain their observations.	paper towels cups, water black marking pens	
Historical context of science teaching			
15. Given a historical setting, describe the major elements of a science course	• Teacher shows a time line dividing science education into three ages: pre-1950, 1960s to present, and late 1980s into the future. The class is divided into teams, and each team is given a problem: "Given this list of characteristics of the period in question, identify and describe a course of study in a high school that would be an outgrowth of these characteristics." Your description should be summarized verbally and graphically on chart paper. It should include at least these elements: 1) philosophy and rationale statement; 2) sample objectives; 3) Who would take this course? 4) Nature of the learning activities; 5) The extent of integration with other sciences and subjects; 6). Use of references, texts and other materials; 7) Evaluation of students; 8) Use of the laboratory.	Transparency of time line Textbooks from each era List of historical characteristics. Trowbridge, page 256. Chart paper Markers Read chapter 16 in Trowbridge.	
	• Teacher asks each group to explain and defend their "course" of study. Teacher leads the class in a discussion: How do these courses differ? Are the course activities consistent with the course philosophy and objectives? Which course is		How do the courses compare? Do students see real differences?

	closest to your own philosophy?		
Goals for Science Teaching			
16. Identify the Project synthesis goal areas.	• Teacher describes recent attempt to describe goal areas for science courses. Teacher describes the four goal areas of Project Synthesis: 1) personal needs 2) social issues; 3) fundamental knowledge and 4) careers	Overhead transparency of goal areas.	How do project synthesis goals compare with students pre-conceived goals of science education?
17. Apply the "science as inquiry" subthemes to science teaching situations	• Teacher outlines four subthemes of the domain of inquiry teaching: 1. Processes or methods of science 2. Nature of scientific knowledge 3. Inquiry as a way of thought: a. values clarification b. process skills c. problem solving d. decision-making 4. Customs of inquiry	Read chapter 7 in Trowbridge Overhead transparency	
	• Teacher explains that we will focus on items 2 and 3, the process of science, and strategies of inquiry-oriented thinking.		
18. Differentiate and use basic science process skills and integrated science process skills	• Teacher divides class into small groups. Each group is given a candle, modeling clay, matches and data sheet. Teacher asks students to *observe* a candle, light it and continue to observe and record their observations.	candle modeling clay matches data sheet: Funk, p.7	
	• Teacher gives each group a box containing mystery objects. Students are asked to make a list of *inferences* and *observations* for the mystery object by shaking, tilting,	several mystery boxes: shoe boxes with objects within data sheet, Funk, p.74	

133

and moving the box about, but not looking inside.

• Teacher asks students to comment on both activities. Teacher identifies the process skills used as basic science skills, and identifies additional basic science process skills: *classification, communication, metric measurement, prediction.*

Can class predict how these processes can be used in science lessons?

• Teacher introduces the notion that some process skills are more involved: they are called integrated science process skills. Teacher identifies the following as integrated science process skills: identifying variables, constructing a table of data, constructing a graph, describing relationships between variables, acquiring and processing your own data, analyzing investigations, constructing hypotheses, defining variables operationally, designing investigations, and experimenting.

• Teacher selects one of the skills: constructing hypotheses, and presents this problem: What factors affect how fast an object (such as a marble) will roll down an incline? Each team is given materials, and asked to experiment with the materials, and to construct at least three hypotheses.

rulers
marbles of various sizes.

• Teacher brings the groups together, and asks for volunteers to describe their hypotheses. Teacher asks the class to analyze the activity. To what extent are "integrated science process skills" used in this activity. How are they different than basic science process skills? Should all high school students be exposed to this?

Can class differentiate basic and integrated science processes?

Challenge of the Unknown			
19. Apply strategies of inquiry in a science teaching situation	• Teacher shows students four types of inquiry strategies (see above). Explains that we will explore values clarification later in the course (on the topics of STS). Teacher explains for each of the succeeding days, we will see a video from the program, The Challenge of the Unknown. Teacher explains that the CU program focuses on problem solving, and how mathematics and science can be made relevant to students.	Challenge of the Unknown Situation: Where Am I?	Can teachers describe ways these videos could be used in a secondary science course?
20. Prepare a mini-inquiry lesson, which focuses on inquiry, includes objectives, teaching procedures, and materials.	• Teacher informs class that each student will prepare a mini-lesson that focuses on inquiry. (lesson should be about 5 minutes in length and will be taught to a small group of peers). Lesson will be taught in rounds durir g the next class session.	Prepare a mini-inquiry lesson	
Journal	• Teacher asks students to write for 2 minutes in their journal about what they learned in today's class.		

Workshop 4: Models of Science Teaching

Goals and Objectives	Procedures	Materials	Evaluation
Thinker of the Day	• Teacher challenges students to jab a straw into a raw potato. In this thinker, the teacher encourages the students to use trial and error, until able to puncture the potato with the straw. When students are able to stab the potato, teacher asks students to either draw a picture illustrating their theory, or to describe their theory in words	raw potatoes plastic straws	How can this demonstration be used in the conceptual change teaching approach?
Inquiry Teaching Rounds			
21. Demonstrate a watch-doing delivery scheme (inquiry) (DI 7)	• Teacher divides the class into teams of four, and designates the teacher in each group for a series of teaching rounds. Each lesson will be 5 minutes in length, followed by a 2-3 minute discussion led by the designated teacher. The DT will be given several questions to help guide the discussion. Questions include: 1. What was the reaction of the learners to your lesson? 2. What knowledge, skills, or attitudes were you hoping to develop in your students? To what extent were you successful? 3. How did you feel about your teaching experience? 4. How do your learners feel you behaved as a science teacher? 5. How did your learners react to this method of teaching?	Handout: questions for D.T.	
	• At the end of each round, a new DT is chosen. When all rounds are completed, teacher conducts a large group discussion focusing on: 1) How successful was your approach in bringing about learning and		How does the class feel about teaching an inquiry oriented lesson?

	satisfaction? 2) What did you learn or rediscover about teaching and learning? 3) How did you go about teaching your inquiry lesson?		What did they learn about inquiry teaching?
Science Teaching Models	• Teacher shows a overhead listing several teaching models: 1. Direct/Interactive Model (Rosenshine) 2. Inquiry models: Values clarification Decision making Scientific inquiry inductive deductive discovery Problem solving 3. Cooperative Learning Teacher indicates that the class will engage in several activities to demonstrate these models.	Overhead of teaching models	What is a teaching model?
22. Apply the direct/ interactive teaching to a science teaching lesson	• Teacher outlines the main aspects of the so-called direct/interactive teaching model. Teacher distributes handout on direct teaching.	AFT research notes on direct/interactive teaching	
	• Teacher explains that a lesson from middle/junior high science program will be used to illustrate the DI model.	Source: Heath Earth Science, ©1984, pp 70-73	
	• Teacher shows the objectives, and lesson plan in the teacher's edition of the Heath Earth Science text. • Teacher then follows a general model of direct/interactive teaching: 1. Reviews previous work 2. Presents and/or demonstrates new content and skills	Overhead of lesson plan Overheads of lesson in student text, pp 70-73 meterstick	

	3. Leads initial student practice 4. Provides feedback and correctives 5. Provides independent practice	adding machine tape pencil	
	• At the end of the "demonstration lesson" teacher asks students to identify the major steps or aspects of the DI model. What are the strengths of the model? When would you use this model in science teaching.		Can teachers describe the direct instruction teaching model, and apply it to science?
23. Apply inquiry teaching models to science teaching situations.	• Teacher asks students: What is inquiry? Teacher uses the responses and relates this discussion to the previous session's topic that dealt with the domain of inquiry.	Trowbridge, Ch. 12	
	• Teacher mentions that some educators differentiate between "discovery learning" and "inquiry learning." Teacher asks students what their thoughts are on these two forms of learning. Teacher indicates that for our purposes discovery learning relates to the basic science skills, and the learning of concepts and principle, whereas inquiry is more problem oriented and includes the integrated science processes.		Does the class understand inquiry?
	• Teacher shows slide that lists four types of inquiry learning approaches: values clarification, decision making, scientific inquiry and problem solving.	Transparency of inquiry models	
	•Teacher distributes list of statements to be used to assess the characteristics of an inquiry teacher. Teacher asks students to respond to the inventory, sum up their scores and compare it to norms provided in the Trowbridge book.	Trowbridge, p 188	
	• To demonstrate an inquiry lesson, teacher	Ref: Paper Towel Testing,	

	selects an activity from a GEMS unit entitled "Paper Towel Testing."	GEMS, Lawrence Hall of Science, UC, Berkeley	
	• Teacher divides the class in groups of four, and explains that they are going to find out about the absorbency and wet strength of four brands of paper towels. • Teacher introduces the activity by challenging the students to test the advertising claims about paper towels, demonstrates how to use the test materials, and then provides time for the students to conduct their experiments. • Students are given materials and data sheets to investigate the problem. When they are finished with their experiments, the teacher asks a spokesperson from each group to report the groups' findings.	Absorbency Test Results and Wet Strength Data sheets	
24. Analyze an inquiry lesson.	• After the demonstration lesson, the teacher asks the students whether this was a guided inquiry lesson, or a free inquiry lesson. To what extent did inquiry occur in this lesson? How did this lesson compare and contrast with the DI lesson?		How well do the teachers analyze the lessons?
Challenge of the Unknown			
25. Compare scientific inquiry to problem solving.	• Teacher recalls that at the previous session we we saw the first episode of the Challenge of the Unknown series. Teacher asks the students how problem solving is different that the guided inquiry session they just participated in?		Can the class differentiate problem solving and inquiry?
	•One aspect of problem solving is information. Teacher informs the class that in this episode of Challenge of the Unknown, we will deal with Information: What do I know? Teacher points out the importance of data collection, analysis, patterns,	Video: Information: What do I know?	

	research, assessing the quality of information. • After the video: Teacher asks, How would you set up, and design a lesson in a science class that had as its central object---problem solving?		
26. demonstrate and analyze cooperative learning teaching models	• Instructor asks students what they know about cooperative learning. Asks if they have heard of any of the following models: • STAD • Jigsaw • Co-op Co-op • Circles of learning • Group investigation		What is cooperative learning? How can it be utilized in science teaching?
	• To demonstrate cooperative learning, class will participate in a training exercise designed to highlight the elements that make for a successful cooperative learning lesson. Teacher divide the class into teams of five, and explains that they are members of a team of astronauts that has crashed on the moon. You are left with only a few items, and need to decide upon each's importance. Your team is to use group consensus to rank order the list of items • Each team will be given 10 minutes to complete the task. • Teacher distributes an evaluation sheet so that each group can compare their results to NASA's suggestions. • Instructor distributes an observation form that can be used to help groups note their communication patterns. Teacher explains how the observation form can be used.	"Survival on the moon exercise" Evaluation sheet	
27. describe the elements of Co-op Co-op	• Instructor briefly describes co-op co-op, and	Video on co-op co-op	

Workshop 5: Science Educators Talk About Teaching

Goals and Objectives	Procedures	Materials	Evaluation
	• Instructor explains that today's session will be a presentation on teaching in Georgia's middle and high schools given by three science educators from Georgia.		
28. explore the nature of secondary science teaching from the perspective of practicing science educators	• Instructor introduces the panel of science educators: • Mary Wilde, Science Teacher, Booth Jr. High School, Peachtree City, Georgia • Pat Sharpton, High School Science Teacher, Gwinnett County • Linda Mitchell, Science Coordinator, K-12 Gwinnett County Schools • Presentations will be as follows: 1. Mary Wilde, Booth Jr. High "Teaching Science in Middle/Junior High School" 2. Pat Sharpton, Gwinnett County "Teaching Science in a High School Science Classroom" 3. Linda Mitchell, Gwinnett County "Current issues and future trends in the Teaching of Secondary School Science."		

Workshop 6: Strategies and Techniques of Science Teaching

Goals and Objectives	Procedures	Materials	Evaluation
Thinker for the Day	• Students will be challenged to propose theories to explain how a needle can be pushed through a balloon without making the balloon burst. Instructor has a student blow up a balloon and tie it off. Instructor ties a string to the end of a long needle, then carefully pushes the needle into balloon and out the other end pulling the string through. Teacher asks students in small groups to propose theories to explain this "phenomenon."	Loftus needle thru balloon apparatus balloon	Does magic have a place in science teaching?
Overview of strategies and techniques to teach science	• Teacher asks students to participate in a brainstorming session on strategies that they think would facilitate critical and creative thinking in high school science. The list is generated, and at the end of the brainstorming session, students are asked to categorize the strategies into critical thinking or creative groupings.	chart paper marker pens	Can students elaborate on critical and creative thinking?
29. Identify clusters of strategies and techniques of teaching	• Teacher shows students overhead listing categories for strategies based on the purpose or goal of the strategy 1. S & T fostering creative and critical thinking Questioning Demonstrations Simulations Role playing Debates Field trips Guest speakers 2. S & T that aid student learning Reading techniques for science Writing techniques for science 3. S & T fostering independent thinking in science Science Process skills	overhead of categories	How do these categories fit with their previous conceptions about science teaching strategies?

Scientific Method
Science Fair projects
Research investigations

Questioning and Science Teaching

30. demonstrate listening-speaking delivery schemes (DI 5)	• Teacher shows a video tape of a classroom scene and asks the class to focus in on the verbal behavior of the teacher. What kinds of statements did the teacher make? Did the teacher ask any questions? What kind of questions?	video of science teacher	
	• Teacher gives students a copy of a questioning category system developed by Blosser, and asks them categorize two questions according to the main categories of system: closed questions vs open questions. The questions shown on overhead: "What kind of rock is this?" "Do you think it is a good idea to build a nuclear power plant in our city?	copies of questioning system by Blosser transparency of questions	Can the class categorize questions using a classification system?
	• Teacher asks the students to observe the teacher again, using the questioning category system. Students are asked to categorize each question the teacher asks.		
	• After the video, teacher asks students to comment on the kinds of questions asked and the effect of the questions on student thinking.	Read Chapter 11, Trowbridge "Questioning and Inquiry"	
31. describe the effect of "wait-time" and other questioning techniques on student thinking	• Teacher presents research by Mary Budd Rowe on questioning strategies, and the relationship of the amount of time a teacher waits after asking a question on student responses. Teacher asks class how long (in seconds) they think most teachers wait after asking a question?		Do teachers understand power of "wait-time?"
	• Teacher mentions classification system based on other models. Teacher asks students to classify	Overhead of sample	

	sample questions according to these systems: 1. categorizing questions according to Bloom's taxonomy in the cognitive domain 2. categorizing questions according the basic science skills and integrated science skills.	questions Overhead of Bloom's taxonomy and relationship to questions Overhead of processes & types of questions
Getting Students to Talk: Discussions, Debates and other Verbal Activities		
32. demonstrate how discussions and debates contribute to inquiry	• Teacher suggests that discussions can be organized as either large group or small group activities. In either case, establishing the environment conducive to communication is essential.	
	• Teacher demonstrates a large group example of fostering inquiry through discussion. Teacher shows students the headline from a newspaper, and asks students what their opinion or position is on this topic. Samples include: "New law requires sterilization of all citizens with genetic defects, long criminal records, and I.Q.'s below 70." "Population growth in third world countries is increasing at an alarming rate." "Bill to permit mercy killing is approved by the US House of Representatives."	Overheads of headlines
	• Teacher demonstrates how to facilitate the discussion on one of the newspaper headlines.	
	• Teacher asks the class to analyze the teaching episode, and identify the teacher behaviors needed to facilitate the discussion. Teacher asks how this type of discussion facilitates inquiry thinking.	Can teachers identify behaviors that facilitate discussion?

	• Teacher demonstrates the use of small groups as a method to facilitate discussion. Each group is given a problem to work on. Within the group, a spokesperson-recorder is selected. Group discusses the problem for about 5-10 minutes. Teacher assembles whole group, and brings the spokespersons from each group into an inner circle, and leads a brief discussion of the groups' results. •Problems/issues for discussion: 1. Should mercy killing be legalized? 2. Should drugs be legalized? 3. Should there be a law limiting the number of children families can have? 4. Should the US and USSR combine resources and plan a joint venture to the planet Mars? 5. Should teachers and/or children who have AIDS be allowed to come to school?	What differences should teachers be aware of when using small group discussion vs large group discussion?
Aiding Student Learning		
33. demonstrates alternative reading-writing delivery schemes (DI 6)	• Teacher introduces the class to the Science Study Skills Program developed by NSTA and NASSP. The program is designed to teach students a number of study skills that will aid student learning. Two will be chosen: • Building your science vocabulary • Reading for meaning	Science Study Skills booklets
	• Teacher shows exercises on page 8-14 on building science vocabulary. Teacher leads the class through the activities and then suggests that they examine a high school textbook and consider possible science vocabulary exercises.	Vocabulary overheads pp. 8-14 SSSK
	• Teacher introduces reading techniques of survey, read, map and check as a way to help students with reading high school science texts. Each of these techniques will	Reading overheads from SSSK

	be illustrated with overheads.	
	• Teacher mentions a computer program, The Language Experience Recorder Plus which can be used to determine the reading levels of texts, and other important data about science texts. The software will be demonstrated if time permits.	Software: Language Experience Recorder
The Challenge of the Unknown		
	• Teacher shows the class episode three: Restatement: How Do I See It? Prior to the video, teacher asks: How do analogies and models help us solve problems? What are following restatements of: maps, graphs, scale models, sheet music, Morse Code, blueprints, shorthand, formulas. Hint: sheet music is a restatement of of the actual sounds of music; maps show geographical relationships, etc. • After the video, teacher asks "What were some examples of restatements in the video?	Video: Challenge of Unknown: Restatement
Journal	• Teacher asks students to write for 2 minutes in their journal about today's session.	

Workshop 7
Part I: Planning and Evaluating in Science Teaching
Part II: Managing the Science Classroom

Goals and Objectives	Procedures	Materials	Evaluation
Thinker for the Day	• Teacher demonstrates the water glass effect: You can fill a glass with water, then turn it upside down without spilling the water. Teacher asks students to explain phenomenon.	water glass plastic catch basin paper towels water	Can students generate explanations?
Part I. Planning and Evaluation			
Lesson Planning: A Process Approach			
34. analyze lesson plans in terms of the following objectives/criteria: •plans include a rationale based on a philosophy of science education; •plans are related to a model of instruction, e.g. Direct Teaching Inquiry Teaching Cooperative Learning Conceptual Teaching •Plans contain objectives written in performance terms, incorporate higher level thinking skills, and/or affective thinking. •Plans contain activities related to objectives. •Plans specific resources, materials and references. •Plans indicate how student	• On an earlier class session students are requested to bring in lessons from their units that match one of the following models: Learning cycle modes Cooperative learning Direct Teaching Model Inquiry Teaching Model Conceptual Change Teaching Model • Students will be asked to bring 5 copies of their lesson plan to be shared with members in a small group. • Each student in the small group will have 5 minutes to explain his/her lesson in the small group. The designated teacher will facilitate a small group discussion of the plan. Questions such as: To what extent is my philosophy of science education reflected in the lesson? Are the objectives appropriate for the students I teach? Does it seem the activities will help me achieve my objectives? Are the students evaluated appropriately? • Each member of each group will have an opportunity	 Trowbridge, p286 p. 288 p. 291 copies of student lesson plans	

learning will be evaluated.	to share his/her lesson plan. • Teacher facilitates a large group discussion of the lesson plans. What models of teaching were used to develop lesson plans? What seem to be the characteristics of interesting lesson plans? What were some suggestions for improving lesson plans?	Do student lesson plans reflect a philosophy that embodies inquiry teaching? Can students articulate the bases for their lessons?
Planning A Unit of Instruction		
35. Discuss the elements of a science unit of instruction	• Teacher asks the class to brainstorm what they they think are the elements and steps for developing a unit of science teaching. • Teacher uses student ideas to suggest the following elements in a unit of teaching: •Philosophy •Rationale for the unit •Concepts/Content •Goals and objectives •Lessons/Activities •Evaluation procedures •Resources and Materials	
Evaluating student Learning		
36. explore the nature of student evaluation	• Teacher asks class how they think students should be evaluated. Teacher writes students' comments on chart paper. Teacher asks students what philosophy will guide their approach to evaluation in the classroom.	
37. explore methods of evaluating student progress in science.	• Teacher outlines (using overhead transparencies) three categories of evaluation procedures: •Informal methods: 1. classroom cues 2. classroom questions by teacher 3. conferencing 4. questions by students	

	•Semi-formal methods 1. checking classroom practice 2. homework •Formal methods 1. Standardized tests 2. Teacher made tests Cognitive Affective Psychomotor		
38. write assessment items that are based on an analysis of content, and domains of learning (cognitive, affective, psychomotor)	• Teacher divides the class into small teams, and gives each team a middle school or high school textbook. Each team is to generate test items that measure student learning in terms of the content, and one of the domains of learning. Students will be shown how to establish a matrix (concepts or content vs the domain of learning) and use it to create test or evaluation items. Some groups will be instructed to develop a pre-test; while others will design a diagnostic test such as those used in conceptual change teaching. • Each team will be given chart paper and pens, and will be asked to generate several test items. • Chart paper results will be posted on the walls, so that the whole class can observe the results.	Secondary text books Chart paper marking pens	Can teachers write test items and categorize them? Can they discuss a rationale for the development of a science test?
Managing the Science Classroom			
39. demonstrate effective classroom procedures for a hands-on science program 40. Organize instructional time in ways that facilitate student learning (MC 13) 41. Provide appropriate directions for instruction and classroom management. (MC10)	• Teacher will provide information on research related to effective classroom management in science. Using overhead slides, the following concepts will be developed and related to science classroom management: (based on work by J. Strange) •classroom arrangement •grouping students •advance preparation •questioning •experimental design: the activity •momentum	Overheads on classroom management.	

42. Clearly organize the routines for the use of materials and make these routines public (MC 12)	•smoothness •investigative activity •with-it-ness •overlapping •group focus and accountability •conclusion •Instructor will demonstrate the approach by carrying out a hands-on activity with the class. The above procedures and philosophy will be implemented. •The activity the students will be engaged in is as follows: Each team of students will build an astrolabe, a device used to measure the angle of objects, such as stars or the moon. After they build the astrolable they will use it to measure the angle of stars which will be pasted to the walls of the room. Data will be collected and compared, and conclusions drawn about star motions. • Teacher will lead a discussion evaluating the effectiveness of the management approach.	cardboard brads string straws metal washers star cutouts	Can teachers discuss the major elements in managing a science class?
Challenge of the Unknown	• Teacher shows video on problem solving: Argument: Am I Right? What is an argument? Should all sides of an an argument be understood? Later in the course we will be exploring the relationship of science to society. How do you think this video program might help in that topic?	Video: Argument	
Journal	• Teacher provides time for students write in their journal.		

Workshop 8: Computers and other Technologies in Science Teaching

Goals and Objectives	Procedures	Materials	Evaluation
Thinker for the Day	• Why does the metal strip bend when it is heated in a flame? Teacher demonstrates the effect, and then asks students to discuss theories and ideas to explain the phenomenon. What concepts could this discrepant event be used with?	bi-metallic knife candle	
The Computer as a Learning Tool			
43. distinguish among five uses of the computer in science teaching.	• Teacher asks the class to make a list of the ways that computers can be used in the secondary science classroom. List is written on chart paper, and posted on the wall.	Video from Harvard ED Tech Center Chart paper	
	• Instructor shows video tape: New Tools for Learning: Using Computers in Science Education.	Read chapter 10, Trowbridge	What is the computer literacy of the class?
	• Teacher asks class to relate what they have seen in the video to ways they have used computers in classroom instruction.	Ref: Children, Computers, and Science Teaching by J. Abruscato, Prentice-Hall	
44. explore uses of computers for classroom science instruction	• Teacher explains that the class will observe and/or participate in computer activities demonstrating the following uses: •Tutorials and Drills •Games and simulations •Computer as a tool for measurement and data analysis		
	• Teacher discusses the use of the computer in the science class for drill and practice and as a tutorial. As a demonstration, teacher use a tutorial for junior high/ middle grade students entitled: Science 2: Geology.	Software: Geology	
	• Teacher discusses the use of the computer in the science classroom for simulations, games and problem solving.	Software: Ecosystems and Island Survivors	Can teachers

	Teacher asks students to compare the kinds of objectives that can be achieved when computer is used for problem solving. Teacher demonstrates problem solving by Ecosystems and Island Survivors software from the Voyage of the Mimi curriculum.		describe possibilities for computers?
	• Teacher discusses the use of the computer as a science laboratory which can be used for measurement and data analysis. Teacher demonstrates this use with Broderbund's Science Tool Kit. Teacher uses this software to do an experiment with light using the probes which are hooked to the Apple.	Software: Science Tool Kit	Can teachers discuss multiple uses of the computer in the science class?
The Computer and Science Writing/Record Keeping			
45. describe ways in which the microcomputer can enhance writing and record keeping in the science classroom	• Instructor suggests ways the computer's word processing capability can be utilized in the science classroom: writing science experiment reports, preparing term papers on science topics, science fair projects, etc. • Teacher demonstrates this function with one of several word processing programs: Bank Street Writer Plus or Appleworks. •Teacher shows two other software programs that be used in conjunction with student individual, and group projects: • Print Shop: allows you to make cards, banners, certificates, covers for books, etc. • Newsroom: a journalistic software program in which students can design, write, and illustrate a newsletter publication.	Software: Bank Street Writer Plus Print shop Newsroom	Can teachers appreciate the possibilities of the computer being used as a writing tool in the science classroom? Do teachers perceive this as a real possibility?
Combining Technologies			
46. describe examples of how the computer can be	•Teacher introduces the class to the Voyage of the Mimi, a curriculum for middle grade students that		

integrated with other technologies, such as with video/TV	integrates instructional formats and styles. The Voyage of the Mimi combines the use of the micro-computer, educational television, and print to create an integrated science curriculum program. •Teacher shows a video describing the program. The video shows how the above technologies are combined in the curriculum.	Voyage of the Mimi curriculum materials Voyage of Mimi, training tape
Journal	• Teacher asks students to write in their journal for the last few minutes of class.	

Workshop 9: Science Curriculum: Science, Technology and Society Issues and Avant-garde Science Projects

Goals and Objectives	Procedures	Materials	Evaluation
Thinker	• Teacher shows students an overhead transparency which contains hundreds of small red dots divided into quadrants. In the center quadrant is a single dot. Teacher asks class what they think this slide is depicting. What are the implications of the this slide for helping students think globally. Teacher introduces concept of Gaia, and suggests the importance of systems, or holistic approaches to thinking in science.	Overhead: Dots Book: Atlas of Gaia	To what extent does the class think globally?
47. identify the importance of science and society issues in the science classroom	• Teacher leads a class discussion of the following as a rationale for teaching science and society issues: 1. Focus on problems 2. Interdisciplinary teaching and thinking 3. Relating science and technology 4. Global awareness and thinking 5. Relationship of science to Societal issues 6. Relevance to students • Teacher asks teachers to share newspaper articles, headlines that relate to one or more of these points. On a previous class session, students are asked to look at newspapers and magazines (especially the Tuesday issues of the New York Times) for science and society stories, reports, and essays.		What kinds of problems have the students found?
48. describe strategies for teaching STS issues in the classroom	• Teacher introduces the students to two methods that can be employed: 1. Values clarification by Raths, Harmon and Simon 2. Kohlberg's moral dilemmas approach		Can teachers distinquish between the VC approach and Kholberg's moral dilemmas?
49. demonstrate the use of an STS lesson in a science course	• Teacher distributes a list of global issues and problems that scientists and science educators agree should be integrated in to the science curriculum. List was developed through research		

	by Rodger Bybee. • Teacher shows an overhead slide that links the problems as a web, indicating the interrelationship of these problems.		
	• Teacher introduces activity, 5's Walk on Thursday. Teacher explains that this activity will help students think holistically, and futuristically about a host of environmental problems. Teacher plays tape. At the end of the tape, teacher divides students in to small groups, and asks them to discuss: •Would they like to live during Trinum's time? • Is such a future possible? Why? • Is such future probable? Why? • How could such a future be prevented?	Tape: 5's Walk on Thursday	How do students react to 5's?
50. describe the goals and objectives of a science course focused on science and society issues	• Teacher describes briefly a course developed by a science teacher, John Christensen, entitled Global Science. Teacher shows curriculum materials, and plays a tape, describing the Global Science course.	Global science texts Tape: Global science	
Avant-garde Projects			
51. describe several pioneering science curriculum projects	• Teacher introduces the students to the following science curriculum projects that represent leading curriculum development projects in science education today. •Project Learning Tree by the American Forest Council •Project Wild by the American Wildlife Federation •Nature Scope by the American Wildlife Federation	Curriculum project materials from these projects	Can the class distinguish among these projects?

- Harvard Educational Technology Center Software and teaching materials

- Focus on Excellence Series by the National Science Teachers Association; although not a curriculum project, these reports describe school curriculum efforts in biology chemistry, physics, earth science, physical science, elementary science, science-technology-Science, and others

Journal

- Teacher provides time for students to write in their journals about today's class.

COURSE SYLLABUS

EDMT 456
Summer, 1990

METHODS AND MATERIALS FOR TEACHING SECONDARY MATHEMATICS

Instructor: Dr. Hiram Johnston
641 Urban Life Bldg.
651-4050

TTh 8:00-11:30 a.m.
354 Sparks Hall

REQUIRED TEXTBOOKS

Johnson, David. (1982). Every Minute Counts: Making Your Math Class Work. Palo Alto, CA: Dale Seymour Publications.

Simmons, George. (1987). Precalculus: Mathematics in a Nutshell. Providence, RI: Janson Publications.

CATALOG DESCRIPTION

EDMT 456. (TE) Methods and Materials of Mathematics for Secondary Education. (5) Prerequisite: EDCI 452. Take concurrently with EDCI 450. Examines instructional materials, teaching strategies, and evaluation procedures for teaching secondary school mathematics.

COURSE OVERVIEW

This course is designed to provide a study of methods, materials and strategies for teaching secondary school mathematics. This course provides an opportunity to investigate both the mathematics content and supporting curriculum materials. The primary focus of this course will be on developing strategies for teaching fundamental concepts and skills of mathematics taught in secondary schools. The course will also provide a study of such topics as lesson planning, classroom management, evaluation, testing, grading, and other important aspects related to effective mathematics instruction.

ORGANIZATION OF THE COURSE

Your instructor firmly believes that a student learns by doing, by participating and by reflecting on what has been done or said. Therefore, participation is essential to success in completing the objectives of this course. The nature of each topic and the constraints of time will bear on how the instruction is organized. For certain topics, a well constructed lecture/demonstration maybe the most effective means of instruction. For other topics-especially those where the teaching process is involved - it is important to foster actual involvement on the part of the learner (you).

A variety of instructional techniques and media will be illustrated and used as on integral part of this course. Calculators and computers will receive particular attention as instructional and problem solving tools.

GRADING PROCEDURES

Your grade in this course will be based on the following:

Laboratory Assignments ....(10 labs x 10 pts.)....100 points
Exams.....(Mid-Term and Final).....200 points

Your grade will be based on the total points (TP) earned in the course.

The grading scale is based on .90, .80, .70, etc.... of the total points. If you have any questions concerning the assignments, projects or exams, please see me after class or call met at 651-4050 to arrange a time when we can meet.

OFFICE HOURS

My office hours are 3:30-5:00 p.m. on Tuesdays and Thursdays. If you need to see me related to the content or assignments of the course, please see me before or after class or call to arrange a time for our meeting.

POLICIES AND PROCEDURES

1. Make-up examinations and make-up lab assignments are possible only when arrangements have been made ahead of time. If you miss class due to illness, please call to make arrangements to make up the missed assignments and computer labs.

2. Any questions related to academic honesty will be subject to the Policy on Academic Honesty as stated on page 59 of the 1989-90 Georgia State University Catalog.

PLEASE NOTE: This course syllabus provides a general plan for the course; deviation may be necessary.

Tentative Schedule

EDMT 456

DATE	TOPICS
6/19	Unit #1 Teaching Mathematics: An Overview
6/21	--- The Nature of Mathematics Teaching --- The Teaching Process-An Overview --- The Mathematics Curriculum --- The Nature of Adolescence

READINGS:

NCTM. (1989). Curriculum and Evaluation Standards for School Mathematics. Reston, VA: NCTM, 1-12.

Crosswhite, F.J. Better Teaching, Better Mathematics: Are They Enough. Mathematics Teacher. (October, 1986), 572-580.

Usiskin, Zalman. (1982). We Need Another Revolution in Secondary School Mathematics. The Secondary School Mathematics Curriculum. Reston, VA: NCTM, 1-19.

6/26 6/28	Unit #2 Inside the Mathematics Classroom --- The Beginning Teacher --- Classroom Management --- Effective Teaching and Learning --- Lesson Planning --- Evaluation

READINGS:

Johnson, D. (1982). Every Minute Counts: Making Your Math Class Work. Palo Alto, CA: Dale Seymour Publications.

Emmer, Edmund and Carolyn Evertson. (1981, January). Synthesis of Research on Classroom Management. Educational Leadership, 342-347.

Rosenshine, Barak. (1986, April). Synthesis of Research on Teaching. Educational Leadership, 60-69.

Johnson, D.W., Johnson, R., and Holubee, E. (1988). Learning Together and Alone: Cooperative, Competitive, and Individual Learning: Minneapolis, MN: Cooperative Learning Center, University of Minneasota, 1-17.

LAB 1: Lesson Planning

LAB 2: Cooperative Groups

Unit #3 Teaching Mathematics: Strategies, Content and Methods (Grade 5-8)

Readings:
7/3
7/5

NCTM. (1989). Curriculum Standards for Grades 5-8. Curriculum and Evaluation Standards for School Mathematics. Reston, VA: NCTM, 65-73.

7/10

Number and Number Relationships
Number Systems and Number Theory
Computation and Estimation
Patterns and Functions
Algebra
Statistics
Probability
Geometry
Measurement

LAB 3: Fractions, Decimals and Percent
LAB 4: Calculators and Problem Solving
LAB 5: Geometry and Measurement
LAB 6: Probability and Statistics

Unit #4 Teaching Mathematics: Strategies, Content and Methods (Grades 9-12)

Readings:

NCTM. (1989). Curriculum Standards for Grades 9-12. Curriculum and Evaluation Standards for School Mathematics, 123-136.

7/12

7/17

Simmons, George. (1987). Precalculus Mathematics in a Nutshell.

Posamentier, Alfred and Stepelman, Jay. (1990). Teaching Secondary School Mathematics. Columbus, OH: Merrill.

7/19

Algebra
Functions
Geometry from a Synthetic Perspective
Geometry from an Algebraic Perspective
Trigonometry
Probability
Statistics
Discrete Mathematics

LAB 7: Algebra

LAB 8: Geometric Supposer

LAB 9: Trigonometry

Unit #5 Materials, Media and Technology

7/24 --- Textbooks and Supplemental Instructional Materials

7/26 --- Media and Models
--- Calculators and Computers
--- Teaching Applications
--- Developing Positive Attitudes

Readings: Selected Articles from Mathematics Teacher and Electronic Learning.

LAB 10: Computers in the Math Classroom

FINAL EXAM, August 7, 8:00 a.m.

Summer Institute
Human Growth and Development

Dr. H. Parker Blount
626 Urban Life
Office: 451-2582
Home: 483-6863

Text: Adolescent Development and Behavior, J. Dusek and Adolescent Development, Newman and Newman. Twelve of you should purchase one of the books and the other twelve the other. They both are consider a resource rather than a mandatory text.

"Our goal is to prepare reflective, inquiry oriented beginning teachers. . . . The institute staff will model behaviors . . . that are based on a reflective, inquiry oriented approach to teaching."

Overview of the Human Growth and Development Portion of the Institute:

The members of the institute with be divided into groups to explore topics relevant to the area of this course. The groups will conduct their own research and make a presentation of approximately one hour to the other members, faculty and students, of the Institute.

Wednesday June 21

The process will begin by each student interviewing at least one teacher. The interviews will be arranged for you. The topic of the interview will be: "What do I need to know about adolescence to be a successful teacher?" You will compile the results of your interview and submit a paper to me by Noon Thursday, June 22.

Friday, June 23

We will meet as a group. You will receive you team assignments. From the data collected in the interviews we will determine the topics that each team will be responsible for addressing.

The Presentation

The group presentation should be about an hour. Use any resources available to you that will help the other members of the group understand the theme, topic, and subject of you presentation. If there are materials that the group should read before the presentation, please make arrangements for them to be reproduced and distributed.

Evaluation

For the "What do I need to know" paper 25 points are possible. The presentation will be worth 50 points and the classroom management project will be worth 25 points. For an "A" you need 90 points; 80 points for a "B", and 70 for a "C"

TIME LINE

Wed.	June 21	Interview, 8:15 a.m. 423 G
Thur.	June 22	Paper due: 12:00 Noon, 626 UL
Fri.	June 23	Review Papers?Determine Topics, 329 UL
Tue.	June 27	Meet w/P.B.
Thur.	June 29	Meet w/P.B.
Fri.	July 7	TBA
Mon.	July 10	Report:
Tue	July 11	Report:
Thur	July 13	Report:
Tue	July 18	Report:
Thur	July 20	Report:

CLASSROOM MANAGEMENT PROJECT

You will be exposed to several sessions on the general topic of classroom management throughout the institute. As part of the Human Growth and Development portion of the institute you will need to do the following:

A. Interview a teacher (there are many on campus during the summer--we will help you find one) who teaches in your subject field on classroom management.

B. Interview the teacher you work with in Cobb County. Observe that teachers classroom management techniques (how does what they do compare with what they said during the interview).

C. Record the results of your interviews and observations. You should both quote and summarize the comments of the teachers interviewed. It is appropriate for you to analyze and evaluate the teacher's classroom management practices. This paper is due Friday July 21 by 12:00 Noon.

D. While at North Georgia College have a session with your mentor on the subject of classroom management. Determine his/her philsophy and practice.

FALL, 1989
EXC 401 (1967)
EXCEPTIONAL CHILDREN AND YOUTH

Text: Hallahan, D.P., & Kauffman, J.M. (1988). Exceptional Children Fourth Edition. Prentice Hall: New Jersey.

Instructor: Dr. Melvin E. Kaufman
Room 708- Urban Life Building
Telephone: 658-2310

OBJECTIVES

1. To know the history of the development of special education.
2. To be aware of the incidence of the major forms of exceptionlity.
3. To know the general behavioral, educational, and physical characteristics of individuals in the major areas of exceptionality.
4. To be acquainted with the basic approaches to the education of exceptional children.
5. To understand some of the major issues faced by exceptional children.

COURSE REQUIREMENTS

It is expected that all students will complete the following requirements:

1. Read the text, handouts, and other assigned readings.
2. Satisfactorily complete the three course examinations.

ASSIGNMENTS

CH.1 INTRODUCTION
CH.9 GIFTEDNESS
CH.2 MENTAL RETARDATION
TEST 1

CH.8 PHYSICAL DISABILITY
CH.5 SPEECH & LANGUAGE DISORDERS
CH.6 HEARING IMPAIRMENT
TEST 2

CH.3 LEARNING DISABILITIES
CH.7 VISUAL IMPAIRMENT
CH.4 EMOTIONAL DISTURBANCE
Test 3

STUDY GUIDE
TEST 1

CH.1. INTRODUCTION
-mainstreaming
- what is the role of a resource teacher, special day school, itinerant teacher, homebound instruction
-what is due process as it relates to special education
-what is the difference between incidence and prevalence
-what are related professional services for exceptional children
-which type of special education service is LEAST intensive and what service is most intensive special education service (within the school system)
-which program would provide management of the total environment
-in what type of class do the majority of exceptional children currently spend most of their day?
-according to prevalence studies, what are the most and least prevalent forms of exceptionalities
-what role did Darwin's theory play in influencing the direction of special education services in the 19th century
-what are the major provisions of PL 94-142
-who pays for special education and who doesn't
-what are the categories covered and not covered under 94-142
-what percentage of children are classified as exceptional
-LRE,what is it

CH.9 GIFTED
-creativity
-divergent thinking
-enrichment
-acceleration
-talent
-textbook author's definition of giftedness
-traditional definition of giftedness
-intelligence testing and the gifted, strengths and criticism
-federal estimates of percentage of gifted versus Renzulli's different estimate
-early physical indicators of giftedness
-differences between boys and girls percentage of giftedness
-academic areas of strength among gifted
-gifted minority students
-should preschool gifted children be allowed to study with older students?
-what subject area(s) produce the best results as a result of acceleration
-giftedness and socioeconomic status
-gifted children and emotional adjustment

CH.2 MENTAL RETARDATION
-adaptive behavior
-mild retardation
-moderate retardation

-severe and profound retardation
-down's syndrome
-functional acadmics
-cultural-familial
-work study programs
-rehearsal and learning
-educator's classification system
-which levels (IQ levels) of retardation are most and least prevalent
-chief factors influencing intelligence
-genetic factors and intelligence
-PKU screening
-fetal alcohol syndrome
-intelligence test reliability and validity
-anoxia
-underachievement and areas of greatest academic problems
-goals of social learning curriculum
-factors in success of retarded workers

TEST 2

CH.8 PHYSICAL DISABILITIES
-physically handicapped
-battered child syndrome
-epilepsy
-quadraplegia- hemiplegia
-prosthesis
-cerebral palsy-cause
-most significant educational problem faced by physically handicapped
-are physically handicapped students being adequately served in the public schools
-spastic paralysis
-athetoid (choreoathetoid)
-cerebral palsy and intelligence
-prevalence of epilepsy
-spinal bifuda and problems with class placement
-atrophy effects
-common terratogenic drugs
-spinal cord injuries
-adolescent pregnancy

Ch.5 SPEECH & LANGUAGE DISORDERS
-articulation (def.)
-stuttering (def>)
-fluency-disfluency
-encoding-decoding
-what are the ingredients of communication
-what are the ingredients of language
-what is phonology and phonological errors
-what is the prosody of speech
-determinants of pitch
-nature of child's first words
-omissions, distortions, additions, substitutions
-voice problems and changes in age of child

-are speech problems more frequent in children who are also behaviorally disordered or have learning disabilities
-role of classroom teacher and speech disorders
-what do we know about the prevalence of language disorders

CH.6 HEARING DISORDERS
-hearing impairment(def.)
-deaf (def.)
-audiometry,speech audiometry,sweep test
-conductive loss
-otitis media
-speech reading
-lip reading
-postlingual,prelingual deafness
-conductive hearing loss
-sensorineural loss
-subject matter most effected by hearing loss
-comparison of the effects of deafness vs. blindness
-handicaps of deaf infants
-total communication-major considerations
-effectiveness of hearing aids
-education of the preschool hearing impaired-major considerations
-the most important organ for hearing (outside the brain)
-prosody of speech
-how is pitch determined

TEST 3

CH.7
-snellen chart and visual screening
-legally blind
-partially sighted
-blindisms
-compensatory skills developed with training in blind
-errors of refraction (major types)
-language adequacy of the blind
-intelligence and visual impairment
-synthetic touch
-mobility- factors associated with its success
-hoover cane
- most frequent type of school placements

CH.3
-prescriptive teaching
-characteristics of definitions of learning disabilities (LD)
-exclusions enumerated in most LD definitions
-standardized test
-mixed dominance
-learned helplessness
-universal characteristic of all LD students
-parents of LD children-their concerns
-1930-40s term "brain injured child" and LD
-U>S. Office of Education prevalence estimate of LD
-Englemann's views on LD
-uses of the Key Math Test

-at what point should ritalin be considered
-types of school placements for LD children-
-students learning to keep track of their own attentional behaviors
-effectiveness of reciprocal teaching approach
-school survival skills training for adolescents
-special problems of LD students in college

CH4.

-neurosis
-psychosis
-ecological approach to BD
-biological approach to BD
-behavioral approach to BD
-author's views on "socially maladusted"
-why are diagnostic labels less important to educators?
- IQs of severe and profound BD children
-giftedness and BD
-social acceptance of mildly BD students
-conduct disorders
-school placements of BD adolescents

TESTS

There will be three objective tests, each counting for 1/3 of your total grade. At least one week's notice will be generally given prior to each examination. The final exam will not be cumulative.

WITHDRAWAL

The rules and regulations governing withdrawal are published in the GSU catalog (graduate and undergraduate). In all cases, these rules will be followed.

Alternative Teacher Preparation Institute

Secondary Mathematics and Science

Internship Program

1991-1992

A Program Funded by the Georgia Department of Education
and implemented by the
Department of Curriculum and Instruction
Georgia State University
Atlanta, GA 30303

ALTERNATIVE TEACHER PREPARATION INSTITUTE

GEORGIA STATE UNIVERSITY

INTERNSHIP PROGRAM

1991-1992

EDCI 472, 473, 474

DR. JACK HASSARD
DEPARTMENT OF CURRICULUM AND INSTRUCTION
651 URBAN LIFE BUILDING
GEORGIA STATE UNIVERSITY
ATLANTA, GEORGIA 30303
(404) 651-2518

MAJORIE 'OLIVO
SALEM JUNIOR HIGH SCHOOL
LITHONIA, GEORGIA

CATHY WARFIELD
PINKNEYVILLE MIDDLE SCHOOL
PINKNEYVILLE, GEORGIA

INTERNSHIP PROGRAM
EDCI 472, 473, 474

DESCRIPTION

The Internship sequence is designed for students in critical shortage areas who are pursuing an alternative certification route through interning rather than completing a student teaching experience. This experience should be viewed as a natural extension of the summer institute or earlier experiences incorporated into the prerequisites for the course. The intern will be supervised by a mentor in the school, and the intern will attend seminars under the direction of a faculty member in the Department of Curriculum and Instruction.

The major purposes of the internship are to:

1. Provide a vital link with the university as the intern is inducted into the profession.

2. Provide opportunities to apply and test principles of learning and teaching strategies developed in previous courses and seminars.

3. Provide opportunities for developing entry-level competence in the full range of teaching functions.

4. Provide opportunities for interns to participate in self-evaluation through viewing and assessing video-tapes of classroom experiences, and for interns to observe peer teachers each quarter.

5. Provide opportunities to share experiences with other interns and mentors and attempt group solutions for problems that arise as a natural result of managing resources and students in a classroom situation.

REQUIRED TEXTS

Emmer, Edmont, et al. (1989). Classroom Management for Secondary Teachers, Englewood Cliffs, NJ: Prentice-Hall.

OBJECTIVES:

1. To participate as an intern-mentor team in a one year clinical teaching experience.

2. To demonstrate the effectiveness of pedagogical, the nature of the student, and process themes presented during the summer to the management, planning, and evaluation or secondary mathematics and science classroom teaching.

3. To evaluate the effectiveness of a reflective, inquiry oriented philosophy of teaching.

4. To reflect on teaching by participating as an intern-mentor team and as a member of ongoing support group of beginning teachers.

5. To identify and explore problems that are unique to the induction phase of teaching and to collaborate as a team in the resolution of these problems.

6. To participate as participant-observers in the study and research of the effectiveness of the alternative teacher training institute, the beginning teacher process, and intern-mentor process.

ACTIVITY PLAN FOR INTERNSHIP (EDCI 472)

Fall Quarter

Verification of satisfactory completion may be initialed by your mentor teacher or university professor.

REQUIREMENTS

The intern has:

A. Preliminary Actions

____ 1. Attended a beginning or new teacher orientation

____ 2. Read the teacher's handbook of school rules and system policies.

____ 3. Examined all resources for teaching in the subject area including curriculum guides, texts, supplementary materials, media materials, and equipment.

____ 4. Conferred with support services staff

____ Counselor

____ Media Specialist

____ Special Education Department Chairperson

____ Other

B. Classroom Teaching Behaviors and Actions

____ 1. Established beginning year (quarter/semester) routines by identifying school policies and procedures, and establishing classroom and record-keeping procedures.

____ 2. Develop a set of rules for student behavior in the classroom.

____ 3. Demonstrated techniques to reinforce acceptable student behavior.

____ 4. Demonstrated techniques to redirect off-task learners.

____ 5. Identified disruptive behavior and taken appropriate and prompt corrective action.

____ 6. Demonstrated a positive learning climate by expressing enthusiasm for subject, learning, and learner.

____ 7. Stimulated student interest in topic.

____ 8. Initiated and maintained classroom communication free from sarcasm and ridicule.

____ 9. Used standard English in class.

___ 10. Provided appropriate directions for instruction and classroom management.

___ 11. Written objectives that state student behavior in measurable terms.

___ 12. Written objectives appropriate for students' ages and abilities.

___ 13. Developed activities which relate to lesson objectives.

___ 14. Specified resources to achieve selected objectives.

___ 15. Written assessment items that measure lesson objectives.

___ 16. Provided constructive feedback to students to encourage further progress.

C. Professional Activities

___ 1. Has had 2 extended observations by the mentor teacher ont he following dates:

1. _____
2. _____

___ 2. Has had 6 standard observations by the mentor teacher on the following dates:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

___ 3. Observed the following peer teachers. (Include peer teacher observation document.)

1. _____
2. _____

___ 4. Has participated in each seminar on teaching at Georgia State University.

___ 5. Has made a video tape of one classroom session.

The intern has successfully completed or demonstrated each item listed above.

_____ _____
Mentor Teacher Date

_____ _____
University Professor Date

ACTIVITY PLAN FOR INTERNSHIP (EDCI 473)

Winter Quarter

Satisfactory completion may be initialed by your mentor teacher or university professor.

REQUIREMENTS

The intern has:

A. Planning for Teaching

____ 1. Prepared an acceptable unit and portfolio.

____ 2. Analyzed and is aware of information provided by the 8th grade CRT, the ITBS, and the 10th grade BST.

____ 3. Prepared appropriate instructional plans using local curriculum guides.

____ 4. Used learning activities which are compatible with the physical environment.

____ 5. Organized objectives in sequential manner.

____ 6. Generated pretest, posttest, and attitudinal assessments for a given unit of study in the assigned subject area.

B. Classroom Teaching Behaviors and Actions

____ 1. Demonstrated an ability to organize the classroom based upon appropriate decisions about time management and space.

____ 2. Demonstrated a knowledge base on teaching strategies.

____ 3. Demonstrated the ability to manage a classroom.

____ 4. Demonstrated a high level of skill in initiating and maintaining classroom communication.

____ 5. Gathered and made use of student information in instruction. These should include learning styles or interest inventories.

____ 6. Demonstrated appropriate content knowledge.

____ 7. Used standard English in class.

____ 8. Identified essential materials for facilitating instruction and determined how and when they should be used.

____ 9. Clearly organized the routines for the use of materials and made these routines public.

____ 10. Organized instructional time in ways that facilitate student learning.

___ 11. Keeps students informed of progress in meeting objectives.

C. Professional Activities

___ 1. Has had 2 extended observations by the mentor teacher on the following dates:

1. _____
2. _____

___ 2. Has had 6 standard observations by the mentor teacher on the following dates:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

___ 3. Observed the following peer teachers. (Include peer teacher observation document.)

1. _____
2. _____

___ 4. Has made a video tape of one session focusing on teaching strategies.

___ 5. Has participated in each seminar on teaching at Georgia State University.

The intern has successfully completed or demonstrated each item listed above.

_____ _____
Mentor Teacher Date

_____ _____
University Professor Date

ACTIVITY PLAN FOR INTERNSHIP (EDCI 473)

Spring Quarter

Satisfactory completion of requirements may be initialed by your mentor teacher or university professor.

REQUIREMENTS

The intern has:

A. Classroom Teaching Behaviors and Actions

___ 1. Demonstrated skills in the development of teacher made tests.

___ 2. Prepared appropriate instructional plans using the curriculum guide.

___ 3. Demonstrated an ability to organize the classroom based upon appropriated decisions about time management.

___ 4. Demonstrated a variety of appropriate teaching strategies.

___ 5. Demonstrated a high level of skills in initiating and maintaining classroom communication.

___ 6. Gathered and made use of student information in instruction (document).

___ 8. Demonstrated appropriate content knowledge.

___ 9. Use standard written English with class.

___ 10. Continued to use appropriate classroom time and space.

___ 11. Continued to practice and reinforce all previous objectives.

___ 12. Written objectives that incorporate higher level thinking skills.

___ 13. Used various types of assessment items to measure lesson objectives.

___ 14. Written assessment items in lesson plan which incorporate higher thinking.

___ 15. Used a logical sequence of evaluation of students, such as pretests, progress checks, and posttests, and included student evaluation of the instruction delivered.

___ 16. Generated acceptable test items or procedures for each form: multiple choice/matching, short answer/fill-in-the-blank, open-ended discussion, and oral response/recitation/observation of performance.

___ 17. Demonstrated how results of student evaluation can be used to evaluate the instruction and plan for remediation, enrichment, and revision of instructional procedures.

B. Professional Actions

___ 1. Has had 2 extended observations by the mentor teacher on the following dates:

1. _____
2. _____

___ 2. Has had 6 standard observations by the mentor teacher on the following dates:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

___ 3. Observed the following peer teachers. (Include peer teacher observation document.)

1. _____
2. _____

___ 4. Has made a video tape of one lesson.

___ 5. Has participated in each seminar on teaching at Georgia State University.

The intern has successfully completed or demonstrated each item listed above.

_____ _____
University Professor Date

_____ _____
Mentor Teacher Date

MATH

CONTENT-RELATED INSTRUCTIONAL REQUIREMENTS

(End of Year Expectancies)

___ 1. Used mathematics manipulatives, visual aids and models useful for developing math concepts, skills, procedures, and for solving problems.

___ 2. Designed and implemented a plan for using calculators and computers in mathematics instruction.

___ 3. Evaluated computer software and available printed materials in terms of their appropriateness and effectiveness in helping students learn mathematics.

___ 4. Used instructional aids such as overhead projectors, chalkboards, bulletin boards, and media for developing mathematic concepts, skills or procedures, algorithm, generalizations, and problem solving.

___ 5. Explored and used different instructional strategies.

___ 6. Identified and used strategies which were relevant to the instructional objectives and appropriate for particular learners.

___ 7. Explored and used instructional strategies for teaching different math subjects and strands.

___ 8. Explored and used strategies that emphasize the importance of language (listening, speaking, reading, and writing) in learning mathematics.

___ 9. Applied research and knowledge on what makes mathematics teaching most effective to teaching mathematics.

_____ _____

Mentor Teacher Date

_____ _____

University Professor Date

SCIENCE

CONTENT-RELATED INSTRUCTIONAL REQUIREMENTS

(End of Year Expectancies)

___ 1. Discussed with the mentor teacher a rationale justifying the study of science.

___ 2. Develop a useable philosophy justifying the use of hands-on science learning experiences

___ 3. Used instructional aids such as overhead projectors, chalkboards, bulletin boards, and media for developing science concepts, skills, or procedures.

___ 4. Demonstrated use of a minimum of 10 different strategies of instruction in their classroom employing large group, small group and individual student activities.

SUGGESTED TEACHING STRATEGIES

___ Large and small group discussions
___ Audio visual aids such as transparencies, charts, models, films, etc.
___ Student/Teacher Contracts
___ Laboratory Activities
___ Teacher Demonstrations
___ Field Trips
___ Illustrated Lectures
___ Individual Learning Packets
___ Computer Simulations
___ Student Reports
___ Projects
___ Printed Work Sheets
___ Outside Speakers
___ Library Research
___ Other: _____

___ 5. Evaluated computer software and available printed materials in terms of their appropriateness and effectiveness in helping students learn science.

___ 6. Used strategies for analyzing teaching and evaluating procedures and correcting problem areas.

_____ _____
Mentor Teacher Date

_____ _____
University Professor Date

THE ROLE AND RESPONSIBILITIES OF THE MENTOR TEACHER

The Goal of the Mentor Teacher should be to help the beginning teacher develop and enhance:

1. Competence--Mastery of the knowledge, skills, and application which effective teaching requires.
2. Self-Confidence--Relief in one's ability to make good decisions, to be responsible, and to be in control.
3. Self-direction--The assurance and ability to take charge of one's personal, professional, and career development.
4. Professionalism--to understand and assume the responsibilities and ethics of the profession.

The Role of the Mentor Teacher should be to become a model:

1. Inn relations with colleagues, students, parents, and others.
2. By demonstrating a commitment to student growth and development.
3. By demonstrating exemplary skills in the classroom.
4. In collaborative endeavors with other professionals (collegial interaction and support).
5. In work habits.
6. By modeling a professional growth commitment; having a personal and professional development plan.
7. By active involvement in professional activities and professional organizations.
8. By seeking knowledge of tends in education, including materials, research, and methodology.
9. By expressing a positive set of values and beliefs concerning teaching as a career.
10. By being a facilitator of change and improvement.
11. By encouraging trust through a confidential and supportive relationship.

The Responsibilities of the Mentor Teacher should include:

1. Meeting regularly with the intern, both formally and informally.
2. Guiding the intern through the daily operation of the school.
3. Arranging for the interns to visit different teachers' classes.
4. Demonstrating lessons for the interns.
5. Observing the intern's teaching and providing feedback.

6. Being a role model in all aspects of professionalism.

7. Developing skills as a mentor as well as a teacher.

8. Supporting and counseling the intern and providing perspective when needed.

9. Monitoring a provisional teacher's progress in completing the requirements of the Alternative Certification Program.

PEER OBSERVATION REPORT

Teacher Observed_____

Date_____ Period _____ Subject _____

Beginning Time _____ Ending Time _____

Focus or Objective of lesson: _____

_____

Teaching task observed _____

_____

_____

_____

_____

_____

_____

_____

_____

Effective practices observed:

_____

_____

_____

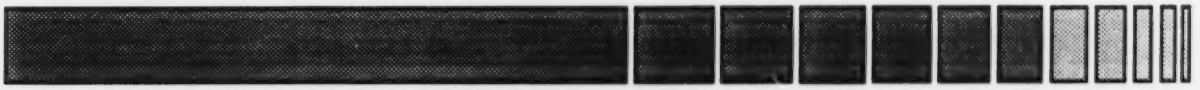
_____

_____

_____

_____

4



On Alternative Teacher Preparation

On Alternative Teacher Preparation

Over the past several years there has been a growing concern about the shortages of qualified foreign language, mathematics and science teachers in the United States. According to recent national reports as many as 15,127 teachers of mathematics, science and foreign language are teaching out-of-field and over a half million students in 29 states are being taught by teachers not certified to teach their subjects (Capper, 1988).

Acknowledging the increased demand for teachers, and the inability of traditional teacher education programs to meet this need, a number of alternative teacher training initiatives have been implemented. Graham (1989) reports that the number of states with alternative certification programs has increased rapidly. In 1984, only eight states offered some form of alternative certification; by 1986, only nine states did not have an alternative certification policy. One of these policies is the creation of programs to train nontraditional recruits for foreign language, mathematics and science teaching at the secondary school level.

Alternative certification is defined as any significant departure from the traditional undergraduate route through teacher education programs (Oliver and McKibbin, 1985). Under alternative certification programs individuals with a bachelor's degree in a subject area are permitted to teach in public schools without having completed a teacher education program.

In the State of Georgia, foreign language, mathematics and science have been identified as critical fields in which there is a shortage of certified teachers. According to

the Georgia Department of Education, over half of Georgia's science teachers are provisionally certified. In 1987, only one-quarter of the teachers who were hired in Georgia's schools were prepared in traditional teacher education programs. It has been predicted that this shortage of certified teachers will continue well into the foreseeable future. Some school districts, such as Atlanta, predict that over fifty percent of the current teaching force will retire by 1992. These, and other projections document a major teacher shortage in the state.

Faculty at Georgia State University have been involved in two alternative certification programs since 1986. One program, the Teacher Recruitment and Internship Project for Success (TRIPS), is a collaborative initiative involving the Atlanta Public Schools, Atlanta Federation of Teachers, Atlanta University, and Georgia State University in cooperation with the Georgia State Department of Education, the Office of the Mayor, and the American Federation of Teachers. The TRIPS program is an intern-mentor alternative certification program designed to attract academically talented foreign language, mathematics and science teachers to work in the urban educational environment. TRIPS interns, after being selected from a pool of recruits, and hired by the Atlanta Public Schools, received summer training in pedagogy (curriculum, methods and clinical teaching), and then were involved in a year long internship under the direction of a mentor teacher, and a college professor. Interns completed their course requirements during the academic internship year, or during the summer following the internship. TRIPS interns and mentors also participated in a week-long summer workshop based on the AFT Educational Research and Dissemination Program (American Federation of Teachers, 1986). Mentors received specialized training in communication skills and conferencing, observation and analysis of teaching, evaluation, and research on supervision (Jensen, 1988).

The second program that we have been involved in is the alternative certification program sponsored by the Georgia Department of Education. In 1987, the Georgia

Department of Education instituted a plan for alternative certification which established criteria for qualified applicants to receive pedagogical training and an internship experience under a trained mentor teacher without going through a traditional teacher education program at a college or university. Under this plan, school systems can train and provide a year long internship by following guidelines established in the document, "Alternative Certification Program for Critical Teaching Fields (Georgia Department of Education, 1987). According to the document criteria, candidates for alternative certification must hold a degree from an accredited college or university, have an overall grade point average of 2.5 on a four-point scale, pass the Teacher Certification Test, and complete a one-year supervised classroom internship in the candidates teaching field. Further, the alternative certification candidate must complete courses, or their equivalents in a) identification and education of children with special learning needs, b) curriculum, c) teaching methodology, and d) human growth and development.

Early in 1988, the Georgia Department of Education proposed to sponsor a summer institute to train 30 alternative certification candidates in foreign language, mathematics and science. The summer institute would provide the pedagogical training in the four areas identified above. Furthermore the institute plan included training of the mentors to prepare them for supervising the one-year internship for the alternative certification teachers. Faculty at Georgia State University planned, organized and carried out the 1988 summer institute, and were involved in directing alternative certification summer institutes in 1989 (Hassard and Jensen, 1988). This article focuses on the goals, organization and effectiveness of the alternative certification program that we developed, and the implications alternative certification programs have for the preparation of teachers. In the next section of the paper, a brief overview of alternative programs will be made, followed by a discussion of the alternative certification program at Georgia State University.

Characteristics of Alternative Certification Programs

In a study by the Rand Corporation, 64 nontraditional programs were surveyed to document the nature of the recruits, program content, effect on teacher supply and program viability (Darling-Hammond, Hudson, and Kirby, 1989). Nine programs were analyzed in depth, including two alternative certification programs, the Houston Independent School District Alternative Certification Program (ACP) and South Carolina Critical Needs Certification Program (CNCP). The ACP program has had over 150 graduates, mostly in fields other than mathematics and science, while the CNCP program has had 61 mathematics and 79 science teachers. Briefly here are some of the findings in the Rand study.

Recruitment Pools. When alternative certification programs were first proposed, it was believed that retirees and ex-military employees would make up a large number of recruits. According to the Rand report, alternative certification programs are attracting midcareer changers and new B.A.s. The researchers suggest that midcareer changers and new B.A.s may be the most sensitive to the financial and opportunity costs posed by traditional teacher education programs. In most alternative certification programs, the investment of time for education and training is minimized by AC policies. This is a very attractive feature of these programs.

Program Content. The specific content of alternative certification programs varies considerably. Most of these programs provide pedagogical coursework (lesson planning, classroom management, teaching methods) to supplement on-the-job experience required to obtain a teaching credential under state alternative certification standards. For example, in the South Carolina program, candidates participate in a two-week summer institute focusing on pedagogical principles and methodological skills, followed by a year long internship as a full-time teacher. During this phase, the teachers participate in eight monthly seminars on teaching methods and classroom management. The program continues with a second two-week summer institute following the first year of teaching. In last phase, candidates must complete three additional graduate courses within three years of

the issuance of the conditional teaching certificate (Hammond-Darling, Hudson, Kirby, 1989). The Rand study reported that most programs ranged from three to four courses in addition to a supervised internship.

Program Costs and Time. One of the attractions of the alternative certification programs is that they generally include a full-time, fully paid teaching internship following a brief summer training program, ranging in length from two to eight weeks. For example, in the Georgia State University alternative certification program, interns can complete their coursework in one summer, followed by a year long internship. Program costs vary considerably. Many alternative certification programs are funded by a third party. The GSU Program is funded by the Georgia Department of Education. Funding sources include state departments, school districts, the federal government and foundation grants. As pointed out by Darling-Hammond, Hudson and Kirby, this reliance on outside funding has made some programs quite vulnerable to funders' changing priorities.

Effecting Teacher Supply. The Rand study found that alternative certification programs represent a small fraction of the teachers needed in the United States. For example, it is estimated that over 20,000 new mathematics and science teachers will be needed each year over the next decade, yet Darling-Hammond, Hudson and Kirby estimate that alternative certification programs only supply about 10 percent of this requirement. AC programs are not a solution to the teacher supply problems, nor are they a threat to the integrity of traditional teacher education programs.

Program Viability. The Rand researchers, generalizing about factors affecting program viability, suggest that an alternative certification program's success is strongly affected by the state of local or regional labor markets. They point out that the alternative program in Houston discontinued mathematics and science training after the first year because there was a much greater need for elementary and bilingual teachers. The TRIPS program in Atlanta was discontinued because Atlanta's need for secondary mathematics and science teachers ceased, and a greater emphasis was placed on elementary and middle

school recruits. Successful programs appear to be ones that remain flexible in how they seek funding, in who they recruit and how they package their programs.

Alternative Certification in Georgia

The alternative certification program developed at Georgia State University was based on the model developed for the 1988 summer institute sponsored by the Georgia Department of Education (Hassard and Jensen, 1988). The institute coordinators devised a model in which objectives, activities and assessment were integrated into a holistic design. Instead of participating in four separate courses (curriculum, methods of teaching, human growth and development, and identifying exceptional children and youth), the alternative certification interns experienced a unified program in which the instructors of the institute collaborated and planned cooperatively all phases of the program. There were 23 interns representing seventeen school districts in the 1988 alternative certification institute. Eleven were in mathematics, six in science and six in foreign language. Each school district appointed a mentor teacher for each intern. The mentor was in the same certificated field, and in the same school as the intern. Mentors participated in one-week of training, while the interns had eight weeks of training. The interns were employed as full-time teachers during the 1988-1989 school year. The school districts agreed to support the efforts of the mentor-intern pairs throughout the school year, and further agreed to participate in an evaluation of the alternative certification program directed by faculty at Georgia State University and North Georgia College.

In an attempt to describe the effectiveness of the alternative certification program, a research study was carried out to compare attitudes of alternatively certified (AC) and regularly certified (RC) beginning teachers. Several studies emerged from this effort (Guyton, 1989). Fox (1989) investigated student-centered and directive attitudes of AC-teachers and RC-teachers. Student-centered attitudes were typified by an empathetic and progressive teacher---one who is concerned with the emotional development of students,

who promotes active and direct involvement of the students in the learning process. Directive attitudes were characterized by a more traditional approach to subject matter and teaching techniques such as maintenance of order and control in the classroom by close supervision. Fox found that by midyear AC and RC teachers exhibited comparable student centered and teacher centered attitudes. AC teachers entered teaching with lower teacher centered attitudes, but at the end of one semester, they were the same as regularly certified teachers. Fox also found that 80% of AC and 77% of RC teachers claimed to have positive attitudes toward students they teach. AC and RC teachers rated themselves similarly in their confidence in teaching ability. However, more AC than RC teachers reported they felt more effective in motivating students (73% vs 60%), were able to deal with individual student differences (80% vs 68%), and more likely to say major problems were not noted in planning lessons (87% vs 72%), class management (68% vs 52%) or student behavior (60% vs 48%) (Fox, 1989).

Fox concluded that the Georgia alternative certification program is producing teachers whose teaching attitudes parallel those of teachers who received certification through traditional programs. Fox also concluded that:

> In addition, these AC teachers display confidence in their teaching abilities, a positive attitude toward their students, and look favorably on their teacher training and induction program. The support received in the induction portion of the program, both from the mentor and the administration, has a positive effect on teacher attitudes. New teachers said that they received help in these areas of improving classroom management, handling discipline problems, dealing with the myriad of paperwork encountered in the profession, learning how to work with individual differences, and using a variety of instructional techniques. Mentors also serve as someone to listen when the new teacher just needs to talk, as a source of encouragement when needed, and as a sounding-board for trying out new ideas. This component emerges as a

critical element in the feeling of success and the effect on attitudes during the first year of teaching (Fox, 1989, pp. 100-101).

In a study of the beginning teachers personal and professional sense of efficacy (belief in their own abilities to bring about positive student learning), Sisk (1989) found there was no difference between the populations of AC teachers and RC teachers in the Georgia study. Sisk pointed out that this refuted the accusations that alternative certification programs recruit skilled functionaries and retreads from other professions. The teachers in the Georgia alternative certification program showed a sense of efficacy no different than traditionally prepared beginning teachers.

Based on the success of the 1988 summer institute, the Georgia Department of Education sponsored alternative certification summer institutes in 1989 at three institutions in Georgia: Georgia State University, North Georgia College and Georgia Southern College.

The GSU Alternative Certification Program (GSUACP)

The curriculum of the GSU institute was based on a design which integrated three themes---pedagogy, the nature of the student and the process of teaching. The curriculum was planned and implemented holistically by a staff of four GSU professors, a high school foreign language teacher, and several consultants (classroom teachers, supervisors, professors as guest speakers). Based on the objectives and curriculum content of the Alternative Certification Program for Critical Teaching Fields (Georgia Department of Education, 1987), the director and staff designed a six-week instructional program that integrated the content of four courses, rather than presenting them separately. Throughout the summer, the interns participated in a variety of teacher training activities---reflective teaching, microteaching, peer teaching coupled with mentor supervision---designed to help integrate the content from methods, curriculum, special education and human growth and development.

Twenty four interns participated in the program. They were selected from a pool of 67 applicants. Applicants who were currently teaching in the public schools with a nonrenewable teaching certificate in foreign language, mathematics or science were accepted without being interviewed by the summer institute faculty. Fifty-six applicants were interviewed for the remaining positions. Of the 24 interns recruited into the program, 12 were recent graduates with a B.A., and 11 were midcareer changers. None were retirees, or ex-military employees. There were ten mathematics interns, seven foreign language, and seven science. By the end of the summer, 22 of the interns had full-time teaching positions in seven school systems in Georgia, most of them in the Metro-Atlanta area. Following is a brief description of the institute, the intern and mentor training, and the academic year internship and seminar program.

Philosophy and Goals

The philosophy of the GSU alternative certification program was based on reflective teaching, inquiry teaching and experiential learning. Reflective teaching is a philosophy based on Dewey's (1938) notion that contemplation and reflective thought are important aspects of professional practice. Throughout the summer institute thinking reflectively about teaching was encouraged and reinforced, especially during the reflective teaching training sessions. The notion of inquiry crosses all the disciplines. It is a way of finding out about the world. It is a way of stimulating curiosity, not only among teacher-inters, but secondary students as well. It is a philosophy of exploration, and one in which the teacher and learner use problem solving means to experience their world. Another philosophical position taken by the institute staff was that instruction in the institute should be experientially based. It was felt that the interns should be actively involved in the learning process, and that the methods used in the institute should reflect the methods deemed important to secondary school teaching. Interns experienced in this training environment a wide range of teaching roles including preparing lessons, assembling and making instructional teaching materials and aids, and presenting and evaluating lessons.

The instructional program was based on the following ideas about teaching: 1) teaching is fundamentally based on relationships and connections among teachers and students; 2) teachers should create environments in which students are encouraged to be active learners, thereby supporting a student-centered orientation to teaching; and 3) that using a variety of instructional methodologies will benefit a wide range of students and their myriad abilities and talents. Thus, throughout the summer, communication, engagement in learning and variety in learning approaches were emphasized in lesson plans and activities with the interns.

The fundamental goal of the summer institute was to provide a practical approach to the training of beginning secondary foreign language, mathematics and science teachers to get them ready for the induction phase of certification during which they would be engaged in a full time internship in a public school. The content that was emphasized included curriculum, methods of teaching foreign language, mathematics and science, human growth and development and characteristics of exceptional children and youth.

Modeling

One assumption the staff made concerning the nature of instruction in the summer institute was that the interns on-the-job-performance could be enhanced if they witnessed and participated in examples of effective teaching and learning. Modeling examples of effective instruction was an essential characteristic of the instructors in the institute. Instead of lectures on "cooperative learning," interns experienced cooperative learning activities, and later were encouraged to incorporate these teaching strategies into the lessons they taught throughout the summer. Borich (1988) identified key and catalytic behaviors that contributed to effective teaching. These ten teacher behaviors included: clarity, variety, task orientation, engagement in the learning process, moderate-to-high success rate, use of student ideas, advanced organizers, questioning, probing and enthusiasm. During the internship year, these effective teaching behaviors were revisited as topics for the monthly seminars.

Program Curriculum

The content of the alternative certification program was divided into a summer institute component of six weeks of intensive pedagogical coursework, followed by a full time teaching position and one-year internship under the supervision of a mentor teacher in the same school as the intern. During the internship period interns and mentors met monthly at GSU for a series of teaching seminars.

Summer Institute. During the summer institute participants received credit for four courses in the GSU College of Education, as follows: Curriculum for Secondary Education, Methods and Materials of Foreign Language, Mathematics or Science (Department of Curriculum and Instruction), Human Growth and Development (Department of Educational Foundations), and Exceptional Children and Youth (Department of Special Education). The summer institute met daily from 8:30 A.M - 4:00 P.M. for six weeks.

Holistic Plan. Each week was organized around a theme in order to help the interns integrate the various aspects of the curriculum. These themes were as follows:

Week 1--Getting Started: Interns were immediately put into small groups to explore what they thought is an effective teacher. They were introduced to research on effective teaching, the reflective teaching model, microcomputers, and the initial elements of teaching in the content areas.

Week 2---Reflective Teaching: Each intern presented a reflective teaching lesson to a small group of peers, visited a middle school in the metro-Atlanta area, became a member of a group to begin a small-group study on the psychology of adolescence which would be presented later in the summer, and were introduced to the direct instruction model.

Week 3--Focusing on Learners and Learning: This shortened week focused on strategies to help students in secondary classrooms learn; interns were involved in a workshop on teaching strategies and techniques in multi-cultural environments, indirect instructional strategies, and were introduced to the microteaching model.

Week 4--Models of Teaching: Interns continued their investigation of indirect methods of teaching, and were introduced to cooperative learning strategies; a video series on classroom management was shown(Battista, 1984), and each intern participated in a microteaching session.

Week 5--Learning from Teaching: Interns continued their study of classroom management and multi-cultural education, but began shifting their focus to peer teaching sessions which began this week and would continue into the next week.

Week 6--Learning from each other--interns and mentors: Interns and mentors met in a residential training session on the campus of North Georgia College in conjunction with their alternative certification institute; each GSU intern presented a 30-minute lesson to a group of about 15 peers ; a mentor was assigned to each intern to carry out a pre- and post-teaching conference; special seminars were held to help interns prepare for the fall; these included experiences of first year interns and mentors from the 1988 alternative certification institute, special curriculum sessions meeting with the state coordinators of science, mathematics and foreign language, and a principal speaking on the nature of a school of excellence.

Conceptual Themes. Three conceptual themes---pedagogy, the nature of students, and the process of teaching---were identified to organize the content of the summer institute.

The pedagogical theme included classroom management and communication, organizing the curriculum, delivering instruction (methods of teaching foreign language, mathematics and science), evaluating students' knowledge and skills and microcomputer technology. The objectives for the pedagogical themes were based on the course guide for curriculum and methods developed for alternative certification programs (Georgia Department of Education, 1987), the Educational Research and Dissemination Program (AFT, 1987), the current literature and practice on effective teaching, and recent trends in the teaching of foreign language, mathematics and science. Interns were asked to develop a

five-day mini-unit based on a model of curriculum and instructional planning in their subject area. The unit included a rationale, five lessons, pre- and post-tests, as well as quizes, handouts, worksheets, laboratory activities, visuals, and a listing of media materials. They were also required to keep a "holistic-reflective log" in which they made daily entries synthesizing what they learned about teaching as a result of their experiences in the institute each day. The log was to reinforce a reflective, inquiry-oriented model of secondary education. In addition to specific methods books in the content areas, interns worked with two texts: Effective Teaching Methods (Borich, 1988), and Classroom Management for Secondary Teachers (Emmer, et.al., 1989).

The nature of the student theme included a study of exceptional children and youth, and an exploration of adolescent human growth and development. Two specialists, one from the Department of Special Education, and the other from the Department of Educational Foundations worked with the institute interns in these areas. In order to model an important instructional strategy for secondary student, interns were organized into small group cooperative teams. Each team investigated one area of adolescent human growth and development (physical, personality, social, cognitive, moral, sexual development). Team members were responsible for working together as a cooperative group in order to plan and carry out an experiential presentation to the entire group later in the summer institute. Teams were encouraged to plan creative presentations as opposed to lecture sessions. The activities were varied, ranging from role playing and psychodrama to video tape interviews with students.

The process of teaching theme included reflective teaching, microteaching and peer teaching. In each of these laboratory teacher training activities, participants presented lessons in order learn how to think reflectively about teaching, evaluate teaching episodes, test out curriculum and instructional ideas, and learn from teaching.

Reflective teaching (Phi Delta Kappa, 1987) is a laboratory model, developed at the Ohio State University. It is a form of peer teaching in which interns experience the

complete act of teaching: planning, execution and evaluation. It develops skills and processes enabling the interns to critique and reflect on the process of teaching. The lessons interns taught were selected from the Phi Delta Kappa published reflective teaching materials. The lessons (in the affective, cognitive and psychomotor domains) contain background information, objectives, materials needed, and special conditions and notes on ending the lesson. Each intern taught one reflective teaching lesson to a group of four or five peers. The class was divided into five groups; in each group the same reflective teaching lesson was presented by a designated teacher. These fifteen minute lessons were conducted over a period of several days, with no more than two rounds being conducted at a session. At the conclusion of the lesson, designated teachers conducted a brief reflective teaching discussion in their small group. These sessions focused on helping the designated teacher reflect on the lesson, and obtain feedback from the learners. The whole group convened for a large group reflective teaching session during which each designated teacher explained the method used to teach the same lesson. The whole group was able to compare and contrast different teaching styles and methods to teach the same objective. Interns in the 1988 and 1989 institutes rated highly reflective teaching, and wished they could have taught more than one reflective teaching lesson.

In microteaching, specific "technical" skills of teaching are practiced with a small group of pupils, who may be peers (Allen and Ryan, 1969). Interns presented a five minute lesson in order to demonstrate a skill of teaching. The microteaching skills that were selected correlated with the direct instruction model developed by Rosenshine (1983). In microteaching, unlike reflective teaching, the teaching session was videotaped, and played back for feedback and discussion purposes. Interns were divided into small teams, each being assigned one of the following microteaching skills: varying the stimulus situation, instructional set, illustration and use of examples, questioning, reinforcement, and closure. Each team selected an intern to present a content lesson focusing on one microteaching skill. Thus, one intern presented a French lesson that illustrated the use of

questioning, another lesson in science focused on illustration and use of examples, and a mathematics lesson demonstrated the use of instructional set. At the end of each microteaching presentation, the instructor facilitated a feedback session that focused on the strengths of the lesson, and how the lesson might be changed for re-teaching. The lesson was taught again (to a new group of students), incorporating changes suggested during the post-teaching discussion.

Peer teaching was used at the end of the institute to give each intern an opportunity to teach a lesson to peers that approximated in terms of time, planning and materials what it would be like in a secondary classroom. Each intern presented a 30-minute lesson which was video taped. Prior to the lesson, the intern met with a mentor teacher in a pre-teaching conference. During this conference, the intern went over the lesson plan, and explained what was the main objective of the lesson. The mentor observed the lesson as it was taught, and then met with the intern to review the video tape and the lesson.

Mentor Training. Mentoring is an integral part of the alternative certification program at GSU. A mentor was identified by the school system for each intern. Because only eleven interns had teaching positions by the fourth week of the institute, only eleven mentors participated in the two weeks of summer institute mentor training. As noted earlier, by the end of the summer 22 of the interns had teaching positions. A special training session was held for the mentors who were not able to participate in the summer training.

During week one of their training, the mentors met separately for five intensive days that focused on responsibilities for assessing the interns, being a mentor, observation and evaluation skills, conferencing and communication skills and structuring the mentor-intern experience. During week two of the mentor training, which held in a residential setting at North Georgia College, the mentors worked directly with interns on the planning and execution of their peer teaching lessons. During this week the mentors took an active role in helping establish the nature of intern-mentor relationships, and by their example

showed the interns the value of the helping relationship that would develop during the first year of teaching.

Internship and Seminar Program.

Following the summer institute each intern was involved in a full time teaching position and participated in one year internship under the supervision of a mentor teacher. The interns earned 15 hours of either college credit at Georgia State University, or staff development credit through the Georgia Department of Education. In either case, each intern and mentor participated in a series of seminars held at Georgia State University.

The purpose of the internship is to give the intern a full-year of teaching experience in a supervised setting. The helping relationship of the mentor is the key to successful first year of teaching. According to Fox (1989), the induction component of alternative certification programs which provides both mentor and administrative support is seen as a crucial factor in assisting the beginning teacher during the first year on the job. Research on the mentoring process suggests a number of roles for the mentor. Anderson and Shannon (1988) outline five roles that were incorporated into the internship: 1) the process of nurturing, 2) the act of serving as a role model, 3) five mentoring functions (teaching, sponsoring, encouraging, counseling, and befriending), 4) the focus on professional and/or personal development, and 5) the ongoing caring relationship.

The key to the internship program is one of support for the intern generated by the mentor with the support of the principal of the school. Coupled with the link to GSU on a monthly basis, the intern is in a position to raise questions about practice, seek help to solve problems as they arise, and not feel isolated during this crucial period of induction. Mentor teachers are there to provide daily support, and evaluate the progress of the intern. The mentors' goal is to facilitate and to help the intern develop and enhance: 1) competence---to master knowledge, skills, and applications which effective teaching requires; 2) self-confidence---to believe in one's ability to make good decisions, to be responsible and to be in control; 3) self-direction---to have the assurance and ability to take charge of one's

personal, professional, and career development; 4) professionalism---to understand and assume the responsibilities and ethics of the profession (Georgia Department of Education (1988).

During the internship period, interns and mentors participated in a year long seminar program at Georgia State University. The monthly seminars were designed to provide time for monthly debriefings, and for the presentation of a topic that was related to on-the-job practice. The following topics were planned by a team of mentors working with the institute director:

Seminar	Topic
October	Discussion of Intern Video Tapes of their Classroom Teaching
November	Classroom management: Assertive Discipline
December	Classroom management: Teacher Effectiveness and Student Achievement (TESA)
January	Cooperative Learning
February	Direct Instruction
March	Student Learning Styles
April	High Level Thinking
May	Affective Education

At the end of the internship period the interns will have completed the coursework and internship thereby making them eligible for a nonrenewable teaching certificate. According to Georgia certification guidelines, teachers have three years to meet the criteria to receive a renewable teaching certificate. Within the next three years, the intern must prepare a teaching portfolio (a teaching unit in the intern's field comprised of seven lessons) and be assessed (according to criteria in the Teacher Performance Assessment Instruments---TPAI) by a team of evaluators (a Regional Assessment Center evaluator, a peer, and a building administrator) Each member of the evaluation team observes the teacher's classroom performance using the TPAI.

Program Effectiveness

Twenty-two of the twenty-four interns were able to get teaching positions by the end of the summer. One of the interns chose not to enter teaching at this time, and the other intern was hired in the fall quarter. In order to determine the effectiveness of the program, the institute staff obtained feedback at the end of each week, and at the end of the summer institute. A research study was also planned that was similar to the study conducted on the effectiveness of the 1988 summer institute program.

Student Feedback. At the end of each week we administered a feedback instrument which asked the interns to rate how satisfied they were with the institute that week, and to make comments about the strengths and weaknesses of the activities. Based on the feedback during weeks 1 - 4, 69% of the interns were very satisfied, 30% were satisfied, and on the third evaluation, one intern expressed dissatisfaction.

After the interns had completed a month of teaching, they were asked to describe their perceptions of the program given their brief period of classroom teaching. They were asked to comment on the program strengths, weaknesses, and recommendations they would make in light of their classroom experience. Comments regarding program strengths were generally very positive. One intern said, "The introduction to the new ideas in pedagogy, especially group learning techniques was important. There was an overall positive feeling among the interns toward one another." This intern also said "...I think the interns are less afraid to go to veteran teachers for advice than traditionally trained new teachers." Another intern felt the positive encouraging atmosphere, honesty about real issues facing teachers, strong academic demands for coursework, and concentration on the most important aspects of preparation for teachers were strengths. A practical strength expressed by one intern was they were able to complete the 20 hours of coursework in one intensive summer institute. This same intern reported that interns were encouraged to be creative, progressive and stimulating teachers.

The interns pointed out weaknesses in the program. One felt there was too much material presented with not enough time to digest and understand it. Another felt more time was needed on microteaching, and there was not enough emphasis placed on classroom management. Some interns realized that there was no substitute for being in a real school working with real students. They expressed a desire to spend more time in the schools during the summer institute. One intern felt the institute did not prepare them enough for all the paperwork they faced in September. Finally one of the interns said, "Nothing could prepare us for the realities of classroom management. Discipline is something that has to be learned on-the-job. Perhaps more ideas showing 'real life conditions' would have been a help."

Several recommendations were made concerning future institutes. In future institutes "more videos showing teachers dealing with behavior problems in the classroom should be included," one intern suggested. Another intern felt the institute should focus more time developing strategies for teaching mainstreamed exceptional children. Others felt more time should be spent on lesson planning. One intern said we should cut down on the assignments and concentrate more on teaching lessons. Another felt that future interns should be involved in a classroom management project, and should interview new teachers. Finally, several interns suggested that the institute make arrangements for interns to teach a few lessons to high school students during the summer.

The feedback from the interns was considered important for future planning, and in making adjustments to the program and the schedule. For example, early during the summer institute it was evident that the interns were spending too much time in "class" and felt they did not have enough time for collaboration or for individual reading and preparation. The schedule was adjusted to provide more time. Listening to the interns has been an important part of the work of the institute faculty.

Research on the Beginning Teacher. One major trend in teacher preparation is the attention that has been given to induction programs---programs that provide

assistance to beginning teachers. As Fox (1989) reported, "the mentoring component of induction programs has been cited as the most influential factor in reducing the downward slide in attitude experienced by many new teachers." Brown, Edington, Spencer and Tinafero (1989) compared the academic performance and classroom teaching performance of teachers who were either fully certified through traditional teacher education programs, were hired by school districts on an emergency permit to teach in areas of need outside their fields, or had completed the first year of the alternative certification program at the University of Texas at El Paso. They found on teachers classroom performance (based on observing each teacher in the study two times) no statistically significant difference across the three groups on the composite score of the Texas Teacher Appraisal System. These results suggest that first year ACP teachers performed as well as teachers prepared through traditional teacher education programs.

Three studies were conducted on the 1988 Alternative Certification Program (Fox, 1989, Sisk, 1989, Guyton, 1989). Fox (1989) concluded that the Georgia Alternative Certification Program is producing teachers whose teaching attitudes parallel those who received certification through traditional programs. Sisk (1989) found that AC-teachers and RC-teachers showed no differences with regard to personal teaching efficacy and teaching efficacy.

Interns and mentors have agreed to participate in a one-year study to help the project staff determine the effectiveness of the 1989 GSU Alternative Certification Program. A series of survey instruments have been administered paralleling the research instruments that were used in the 1988 Georgia Alternative Certification study (Guyton, 1989). At the beginning of the institute (June, 1989), the interns completed the following survey instruments: 1) a participant information form; 2) a survey gathering information on influences, attitudes and concerns about teaching; 3) the Teacher Efficacy Scale (Gibson, 1983); and 4) the Educational Attitudes Inventory (Bunting, 1984). This baseline data will be used to compare changes throughout the first year of teaching, especially with regard to

the interns sense of efficacy, and attitudinal changes with regard to student-centeredness vs teacher directedness. In order to measure these changes, the Teacher Efficacy Scale and the Educational Attitudes Inventory was administered after the institute (August), at the end of the Fall term, and at the end of the year.

The Future of Alternative Certification

Research results and experience have been encouraging with regard to the efficacy of alternative certification programs, not only in Georgia, but in other states as well. Plans are underway at GSU to "institutionalize" an alternative certification program for secondary foreign language, mathematics and science teachers. There are several reasons why this is an important idea.

Alternative certification programs are shaping and perhaps even contributing to the redesign of teacher education in the United States. The alternative certification programs that have been developed in the past few years such as the South Carolina Critical Needs Certification Program, Houston Independent School District Alternative Certification Program, and the Georgia State University Alternative Certification Program are three different models of teacher training. Results of initial research studies aimed at evaluating these programs' effectiveness have been encouraging. In each case, the model of alternative certification used in these separate institutions is preparing teachers who fare as well during their first year of teaching as those beginning their careers through a traditional program. But as new models on the teacher education scene they provide an impetus for reform, not only at the institutions that coordinate the alternative certification program, but at others institutions who might be willing to make changes. The alternative certification models need to be studied, and tested. Graduates of these programs should be followed through several years of teaching. Do they remain in the profession beyond five years? Do they still feel a strong sense of efficacy? What are their attitudes about teaching and students after five years?

Alternative certification has provided a viable option for many people to enter the teaching profession through an alternative route. The program has attracted people with strong academic backgrounds (BAs in either foreign language, mathematics or science). In fact, half of the 1989 GSU interns were recent B.A. graduates. The program has also attracted midcareer changers--people who have worked for a few years, usually as engineers, scientists or mathematicians in industry or government. Most of people in the GSU Alternative Certification Program report that they chose teaching at this time because they wanted an opportunity to work with young people, were very interested in their subject matter, and this was a way to communicate that interest and enthusiasm to others. Darling-Hammond, Hudson and Kirby (1989) reported that the single most important reason for entering teaching among alternative certification recruits was interest in subject matter. Following this reason was recruits' abilities were well suited to teaching, and this new profession would give them an opportunity to work with young people.

Recruits to alternative certification programs should be treated differently than students in undergraduate teacher education programs. These recruits come to the alternative program with a degree in an academic area (and in some cases with advanced degrees), often with prior work experience, but most importantly with very strong convictions and interests in entering the teaching profession. Sisk's study (1989) refuted the accusation that those who choose alternative certification routes are "simply trained functionaries and retreads from other occupations." She could find no difference in alternatively certified teachers from traditionally trained teachers on their sense of efficacy. One of the criticisms of alternative certification programs has been that interns do not need to take as many credit hours of course work as do their counterparts in traditional teacher education programs. Some critics charge that alternative programs are not as rigorous as traditional programs. Alternative certification programs provide many experiences that more than make up for any deficiencies in numbers of credit hours. Unlike traditional teacher education programs, alternative certification programs work with beginning teachers

through their first year of on-the-job teaching, and in some cases AC programs work with interns for three years. Many programs involve the interns and mentors in a seminar series, thereby providing opportunities for the beginning teachers to share their problems with each other, and gain insights from the experienced, mentor teachers. Alternative certification programs also involve mentors as teacher educators in-the-field, adding a component that traditional programs lack.

Alternative certification has provided an opportunity for college and university faculties of education to rethink the nature of teacher education, and begin to visualize and plan new approaches to teacher training. At GSU, the alternative certification is being considered as an institutionalized alternative program within the College of the Education. By institutionalizing the alternative certification program, potential recruits and school systems in the state will be assured of a program leading to certification. The shortage of teachers in secondary fields of foreign language, mathematics and science is predicted to extend into the future. By making it possible for highly qualified individuals to enter the teaching profession through an alternative route is a path whose time has come.

Bibliography

Allen, D. & Ryan, K. (1969). *Microteaching.* Reading, MA: Addison-Wesley.

American Federation of Teachers. (1987). *Educational Research and Dissemination Program.* Washington, D.C.: AFT Educational Issues Department.

Anderson, E. M. and A.L. Shannon. (1988). Toward a conception of mentoring. *Journal of Teacher Education.* January-February, 38-42.

Battista, N. (1984). *Effective management for positive achievement in the classroom.* Phoenix, AZ: Universal Dimensions, Inc.

Borich, G. (1988). *Effective teaching methods.* Columbus, OH: Charles E. Merrill.

Brown, D., E. Edington, D.A. Spencer and J. Tinafero. (1989). A comparison of alternative certification, traditionally trained, and emergency permit teachers. *Teacher Education and Practice.* Winter/Spring.

Bunting, C. E. (1985). Dimensionality of teacher education beliefs: A validation study. *Journal of Experimental Education,* 53, 188-192.

Capper, J., "A Study of Certified Teacher Availability in the States," Council of Chief State School Officials, 1988.

Cruickshank, D. R. (1986). *Reflective teaching.* Bloomington, IN: Phi Delta Kappa.

Darling-Hammond, L., L. Hudson, and S.N. Kirby. (1989). *Redesigning teacher education: Opening the door for new recruits to science and mathematics teaching.* Santa Monica, CA: The RAND Corporation.

Dewey, J. (1938). *Experience and education.* New York: Collier.

Emmer, E., C. M. Everston, J. P. Sanford, B.S. Clements, M. E. Worsham. (1989). *Classroom management for secondary teachers.* Englewood Cliffs, NJ: Prentice-Hall.

Fox, M.C. (1989). *A study of educational attitudes of alternatively certified and traditionally certified beginning teachers.* Unpublished Doctoral Dissertation, Georgia State University, Atlanta.

Georgia Department of Education (1987). *Alternative certification program for critical teaching fields.* Atlanta.

Georgia Department of Education (1988). *Internship Manual: Guidelines for Staff Development Course.* Atlanta.

Gibson, S., & Dembo, M. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology, 76* (4), 569-583.

Graham, P. (1989). The other certification: More benefits than risks? *NEA Today.* January, 75-79.

Guyton, E. (1988). *Becoming a teacher: Descriptions and comparisons of the first year of teaching who experienced three different teacher preparation/induction programs--Report of the research component of the TRIPS project.* Atlanta, GA: Georgia State University.

_____(1989) *Becoming a teacher: The research report of the 1988-1989 Georgia Alternative Certification Program.* Atlanta, GA: Georgia Department of Education.

Hassard, J. & Jensen, R. (1988). *An alternative secondary teacher training model: The Georgia model,* ERIC Clearinghouse on Teacher Education, Document SP030924.

Jensen, R. (1988). *Supervision of TRIPS interns by Georgia State University personnel, final report.* Atlanta, GA: The Georgia Department of Education, Title II, Education for Economic Security Act Demonstration and Exemplary Programs.

Oliver, B. and McKibbin, M. (1985). Teacher trainees: Alternative credentialing in California. *Journal of Teacher Education,* 36(3), 20-23.

Rosenshine, B. (1983). Teaching functions in instructional programs. *Elementary School Journal,* 83, 335-351.

Sisk, K.A. (1989). A study of beginning teachers' sense of efficacy. Unpublished Doctoral Dissertation, Georgia State University, Atlanta.

5

Status and Perceptions of Alternatively Prepared Foreign Language, Mathematics and Science Teachers

Status and Perceptions of Alternatively Prepared Teachers

Georgia State University has been involved in alternative teacher preparation since 1986 (Table 1). The Department of Curriculum and Instruction was the first department to prepare teachers through an alternative route. The first program, the Teacher Recruitment and Internship Project for Success (TRIPS), was a collaborative initiative involving the Atlanta Public Schools, Atlanta Federation of Teachers, Atlanta University, and Georgia State University in cooperation with the Georgia Department of Education, the Office of the Mayor, and the American Federation of Teachers. TRIPS was an intern-mentor alternative certification program designed to attract academically talented foreign language, mathematics and science teachers to work in the urban educational environment. Sixteen interns were recruited and prepared through the TRIPS program, and were hired by the Atlanta Public School system. Twelve of the sixteen interns are still teaching in the Atlanta Public Schools.

In 1988, the Georgia Department Education funded a Summer Institute for Secondary Foreign Language, Mathematics and Science teachers, and awarded the contract to conduct the Institute to the Department of Curriculum and Instruction at GSU. Twenty-three interns and a corresponding number of mentors participated in a Summer Institute held at the Ramada Inn, in Athens, Georgia. An intensive eight week institute was planned and carried out for the interns (Hassard and Jensen, 1988). During the eighth week, 23 mentors participated in a special training program to prepare them to work during the induction phase with the interns. Seventeen school districts around the state of Georgia cooperated with the project to coordinate the internship program for the interns.

Beginning in 1989, GSU received three one-year grants to plan and carry out an alternative teacher preparation program for individuals holding at least a bachelors degree

in foreign language, mathematics or science. The alternative teacher preparation program developed at Georgia State University was based on a model developed by Hassard and Jensen (1988). Devising a model in which objectives, activities and assessment were integrated into a holistic design, four courses were merged into an unified program. The model consisted of a six-week Summer Institute, followed by an academic-year internship carried out in a Georgia school. Interns were fully-employed teachers who were assigned a mentor in their teaching field to facilitate the internship program. Interns, mentors, and professors participated in monthly seminars focusing on problems and issues encountered by the participants.

Table 1

History of Alternative Teacher Preparation in the

Department of Curriculum and Instruction

Year	Program	Description
1986-1987	TRIPS	8 interns/4 mentors in the Atlanta Public Schools. Interns enrolled in pedagogical classes in the Summer quarter, followed by a one-week intensive training by the AFT. Supervised three-quarter internship by GSU professors followed the Summer program.
1987-1988	TRIPS	Same as the 1986/87
1988-1989	First Alternative Teacher Preparation Summer Institute	Eight-week Summer Institute held in Athens for 23 interns; one-week of training for mentors in conjunction with interns. School districts supervised year-long internship. Funded by the Georgia Department of Education
1989-1990	Alternative Teacher Preparation Institute	Six-week Summer Institute at GSU for 24 interns. Sixth week held at N. Georgia College with mentors, and in conjunction with the NGC Summer Institute. Full-year Internship-Seminar program supervised by GSU and school districts. Funded by the Georgia Department of Education
1990-1991	Alternative Teacher Preparation Institute	Six-week Summer Institute at GSU for 23 interns; sixth week at N. Georgia College with mentors. Full-year Internship-Seminar Program. Funded by the Georgia Department of Education
1991-1992	Alternative Teacher Preparation Institute	Six-week Summer Institute at GSU for 22 interns; mentor training during the sixth week. Full-year Internship-Seminar program. Funded by the Georgia Department of Education.
1992-1993	The TEEMS Project	Five - quarter project to conduct a follow-up study of the graduate of the GSU Alternative Teacher Preparation Institute, and to develop a model for an alternative teacher education program at GSU for mathematics and science teachers. Funded by the Professional Standards Commission

Purpose of This Report

The purpose of this status and perception report is to describe the current status of the alternatively prepared foreign language, mathematics, and science teachers who participated in the Alternative Teacher Preparation Institutes for the period 1989-1992 at GSU.

First we will describe the current status of the graduates in terms of a series of demographic characteristics. Secondly, a report will be made of the participants perceptions of the training and education they received in the program based on a survey instrument that was sent to the 69 alternatively prepared teachers.

The Participants

Sixty-nine individuals participated in the Alternative Teacher Preparation Institutes conducted in the Summers of 1989, 1990, and 1991 (Table 2). 24 interns participated in the year 1 institute, 23 in the second and 22 in the third Summer.

Table 2

Alternative Teacher Preparation Participants by Year and Subject

Group	Foreign Language	Mathematics	Science	Total
Year 1: '89-'90	7	10	7	24
Year 2: '90-'91	7	6	10	23
Year 3: '91-92	0	9	13	22
Total	14	25	30	69

Over the three year period, we prepared 14 foreign language teachers (all of them are still teaching), 25 mathematics teachers (18 are still teaching) and 30 science teachers (25 are still teaching.

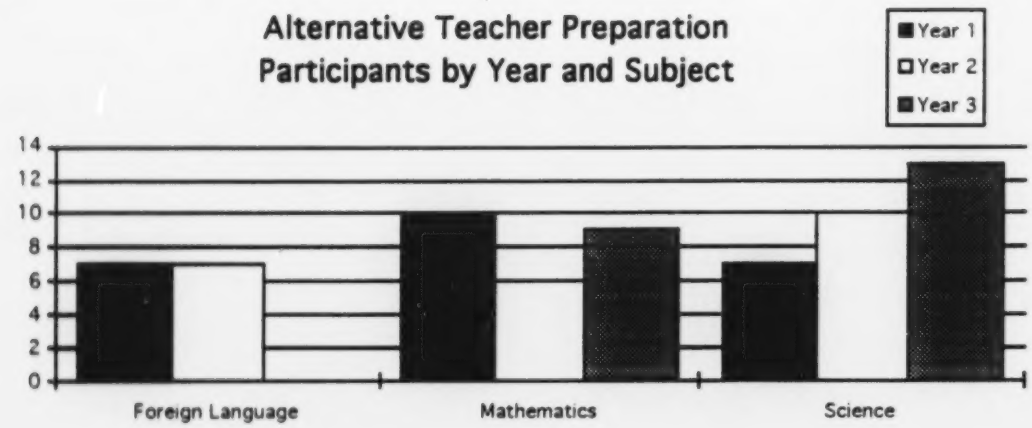


Table 3 reveals that 83% of the original participants are currently teaching. Actually, the percentage of retention is higher because of the 69 interns prepared in the program, 63 choose to begin a career in teaching. Thus the actual retention rate of the interns who took teaching positions is 90%.

Table 3

Participants Teaching as of 6/93 by Year and Subject

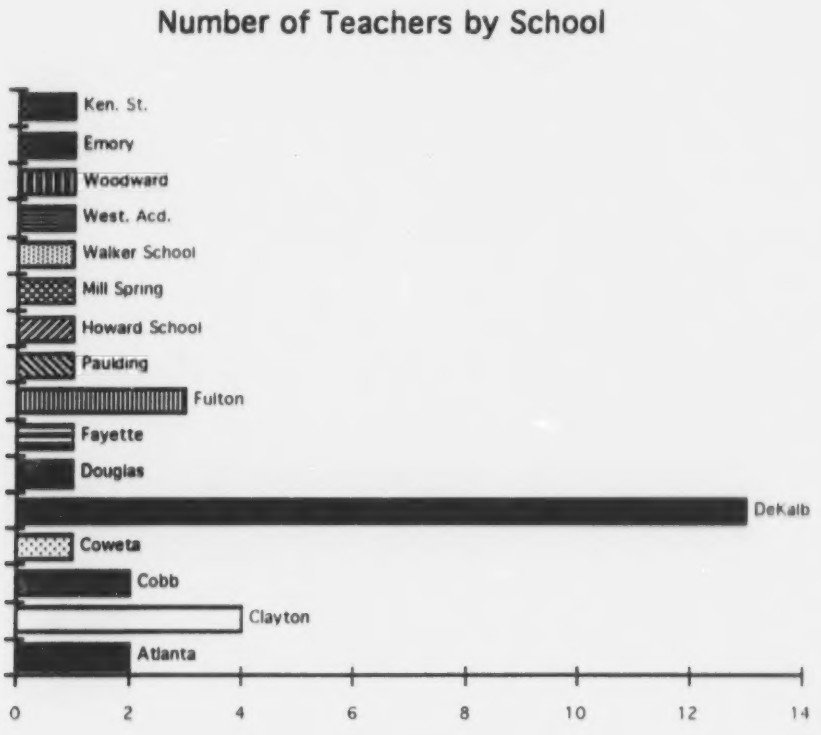
Group	Foreign Language	Mathematics	Science	Total
Year 1: '89-'90	7	8	5	20 (83%)
Year 2: '90-'91	7	5	10	22 (96%)
Year 3: '91-92		5	10	15 (68%
Total	14	18	25	57 (83%)

Current Teaching Status

To find out what was the current teaching status of the alternatively prepared teachers, a questionnaire was designed and sent to each participant. Forty questionnaires were returned representing a return rate of 58%.

Where Do They Teach? When interns graduated from the Summer Institute, most took teaching positions in the Metro-Atlanta area. However, several were hired in

locations as far away as in the Savannah-Chatham School District, Brunswick, and Dublin, Georgia. DeKalb County was the leading employer of GSU alternative teacher



preparation graduates. The relationship with DeKalb was highlighted by collaboration with Anne Hightower, staff development specialist, and creator of DeKalb's alternative teacher certification program. This data is based on the responses to the questionnaire, and consequently, other alternative graduates were employed not only in other school systems in Georgia, but in other states.

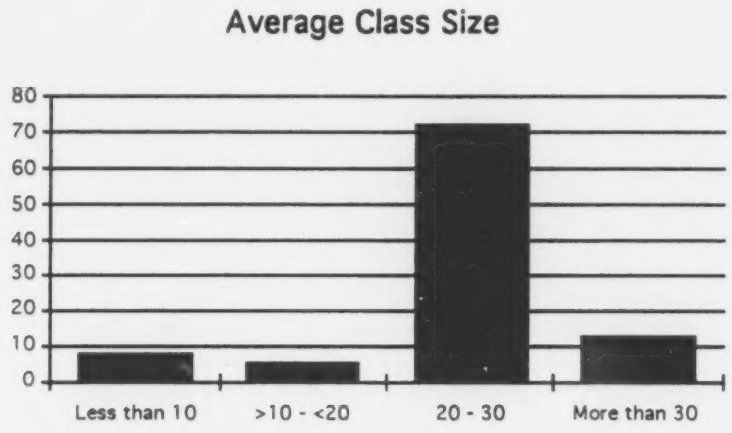
Classes Taught? Most of the teachers reported that they had a teaching load of five classes (Table 4). Twelve teachers reported teaching four or fewer classes, and three indicated they were teaching six classes.

Table 4

Total Classes Taught in Area of Certification

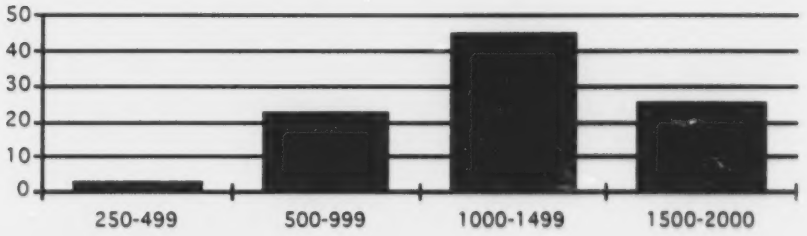
Number of Classes	Frequency	Percent
Less than 4	4	10.0
4	8	20.0
5	18	45.0
6	3	7.5
More than 6	6	15.0

Average Class Size? Over 70% of the teachers reported that they were teaching classes with between 20 and 30 students. This is consistent with national statistics reported by the National Center for Educatioin Statistics (1992). Teachers in the Alternative Teacher Preparation group indicated that less than 15% were teaching classes with more than 30 students.



Size of the Schools? Forty-five percent of the teachers are teaching in schools that have between 1000 - 1499 students. When combined with the next highest category, nearly 70% of the participants are teaching in schools with more than 1000 students.

Percent Distribution of
Teachers by School Size



Non-Teaching Duties? Table 5 indicates that teachers are involved in a variety of non-teaching duties (restroom cafeteria, etc.) and outside activities (clubs, yearbook, coaching, etc).

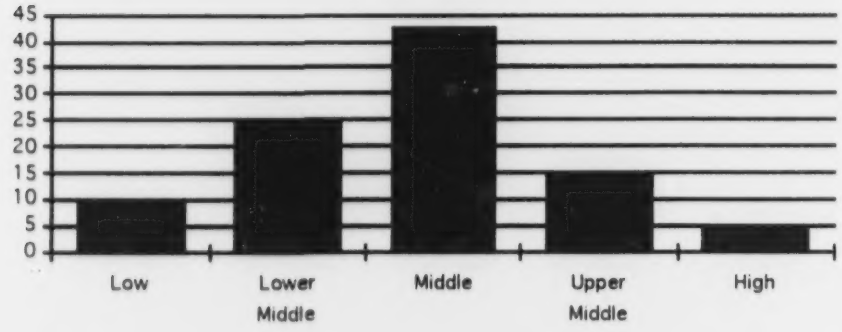
Table 5

Number of Non-Teaching Duties

Number Non-Teaching Duties	Frequency	Percent
Less than 2	16	40.0
3-4	10	25.0
5-6	11	27.5
More than 6	3	7.5

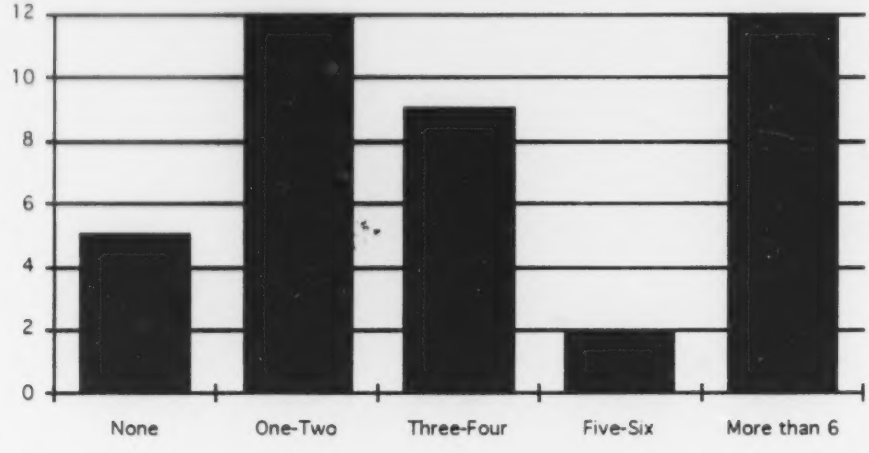
Socio-Economic Status of Schools? Thirty-five percent of the teachers reported teaching in lower middle and low socio-economic area schools, while only twenty percent were teaching in upper middle or high economic area. Over 40% were teaching in middle socio-economic area schools.

Percent Distribution of Teachers by Socio-Economic Status

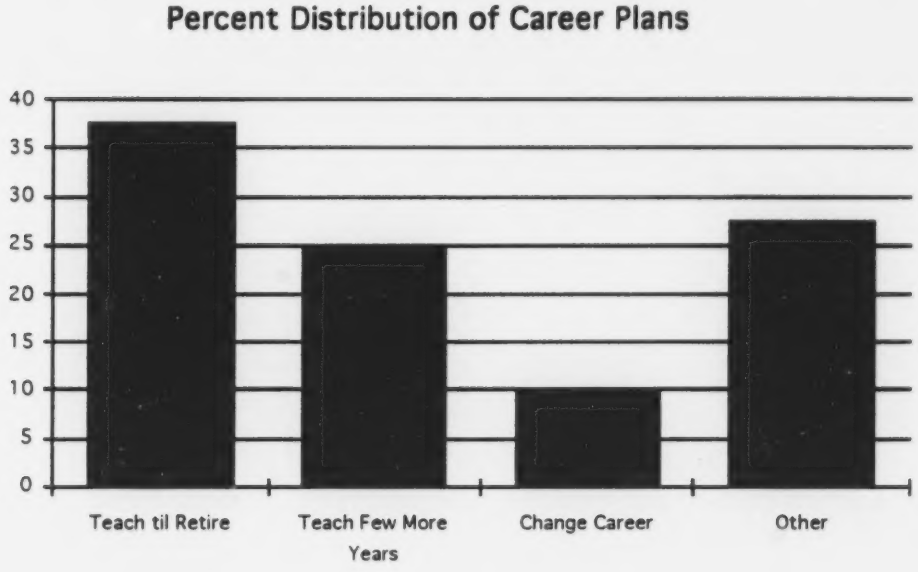


Staff Development Participation? All the teachers reporting to us indicated that they were involved in some form of staff development training. Over 50% of the teachers indicated that had been involved in more than three staff development courses since graduating from the Alternative Teacher Preparation Institute.

Frequency of Staff Development Courses Since Training



Future Plans? Nearly 40% of the graduates indicated that they plan to teach until they retire. 25% plan to teach a few more years, and only 10% plan to change careers.



Perceptions of the Teacher Education Program

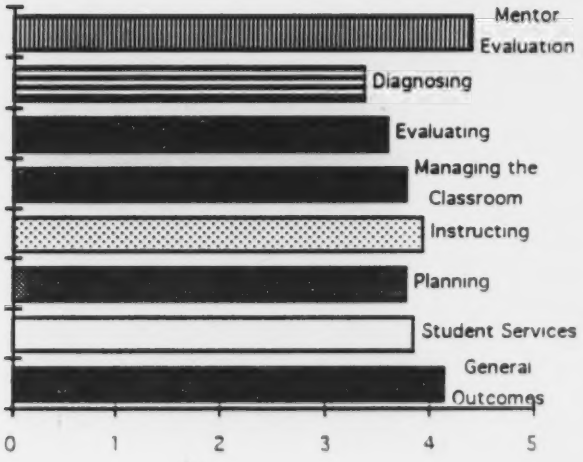
To evaluate the perceptions of the graduates of the Alternative Teacher Education Program, the Survey of Graduates instrument was administered to all participants. The Survey is an objectively scored paper and pencil questionnaire which was based on the Survey of Graduates questionnaire developed at the University of Minnesota. It is composed of 47 items designed to evaluate the teachers' perceived rating of different areas of their teacher preparation program. The survey is divided into four sections: overall rating of the program, student services, pedagogical knowledge, and quality of mentor guidance. The pedagogical knowledge section consists of five areas of measurement:

- Planning
- Instructing

- Managing the classroom
- Evaluating
- Diagnosing

Overall Results. The participants responded to a questionnaire that evaluated the program in three areas: mentor evaluation, pedagogical knowledge, student services (of the university), and as well as an overall rating of the general outcomes of the program. As seen in the graph below, the participants rated the quality of the mentor rating they received highest of the three areas measured. This was consistent with interviews we conducted with some of the participants. Participants rated their mentors high, and felt that they had positive relationships with their mentors, as well as receiving feedback and support.

Overall Evaluation of the Alternative Teacher Preparation Program



When we examine the results on pedagogical knowledge, we note that the ratings are fairly even across the five pedagogical areas. The Summer Institute stressed classroom management, planning, and teaching skills. These areas were rated higher than the two areas we did not stress, namely evaluation and diagnosis. Although managing the

class and instruction were rated higher than the other pedagogical areas, teachers, when interviewed, reported that they still are very concerned about discipline and student motivation. (See section 7 of the Sourcebook for more details on the interviews).

When we examine the rating the participants made about the nature of the services they received from the university, teachers reported satisfaction with the quality of the advising, educational planning, career planning, and teacher education requirement that they received.

We asked the participants to give us feedback on the "general outcomes" of the Alternative Teacher Preparation Program in terms of the nature of the instruction they received on topics such as:

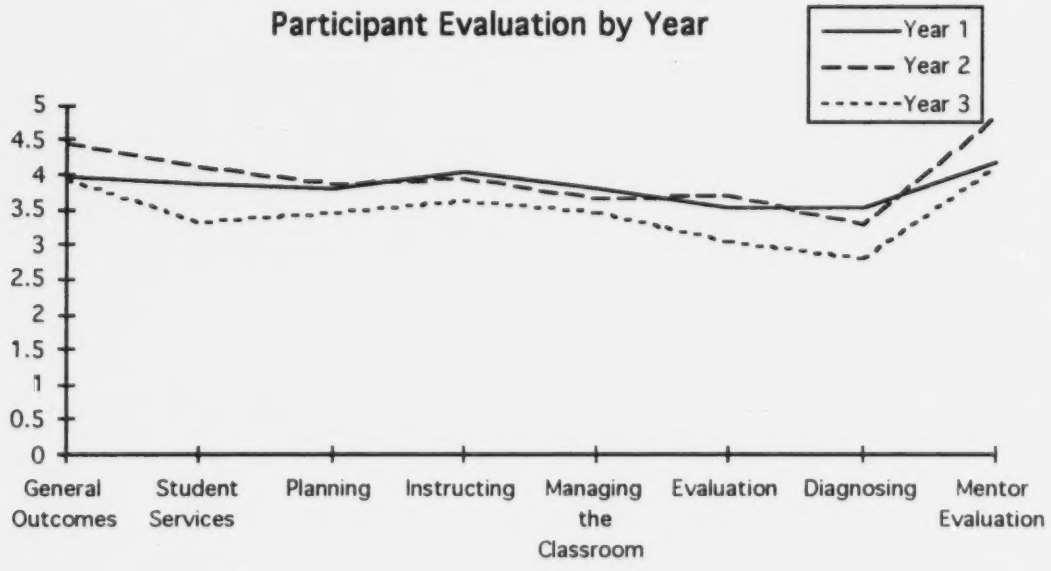
- Learn a variety of methods for teaching my subject (s).
- Learn how social/psychological theories could be applied in professional practice.
- Develop competence in teaching as a result of the internship.
- Develop an understanding of the social contribution teachers can make.
- Develop a positive attitude toward teaching.
- Develop a sense of professional responsibility.

On a scale of 1 - 5, the participants rated the General Outcomes 4.13, which can be interpreted as a high rating. And when we look over the three years data, we find that the rating is consistently high.

Yet, even with these high ratings, we should be cautious in evaluating the efficacy of the program. Teachers reported in interviews that they felt that they would have profited if they had had more experiences in the "real world" of the classroom. This was a problem that we addressed in different ways each Summer. Since the institute was only six weeks, there was not very much time for direct work with students in the secondary schools in the Metro-Atlanta area. However, we did have the participants visit middle and high schools for as many as three days during the Summer. However, the nature of

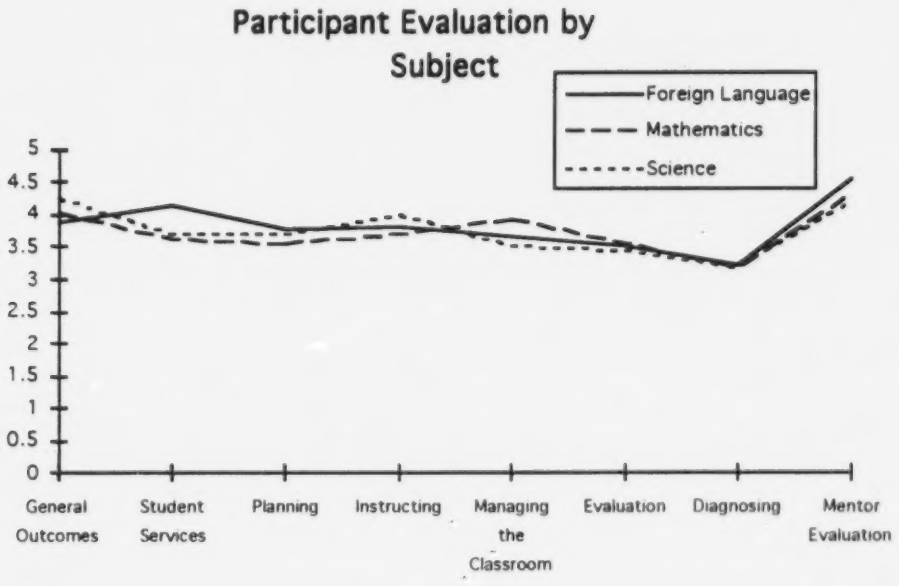
the experiences varied. In some cases, interns did get an opportunity to teach a lesson. But in general, the interns observed classes in session, and had very little opportunity for student-teacher interaction.

Perception by Each Group Three different groups of interns participated in the Alternative Teacher Preparation Institute in three consecutive years. The Year 1 group (1989-1990) consisted of 24 foreign language, mathematics and science interns. Year 2 consisted of 23 foreign language, mathematics and science interns, while the Year 3 group was comprised of only mathematics and science interns. It was in the third year that we decided to drop foreign language from the Institute. As shown in the graph below, the profiles of scores for each year was parallel, and there were no significant differences in the participants evaluation of the program among Year 1, Year 2 and Year 3 groups.

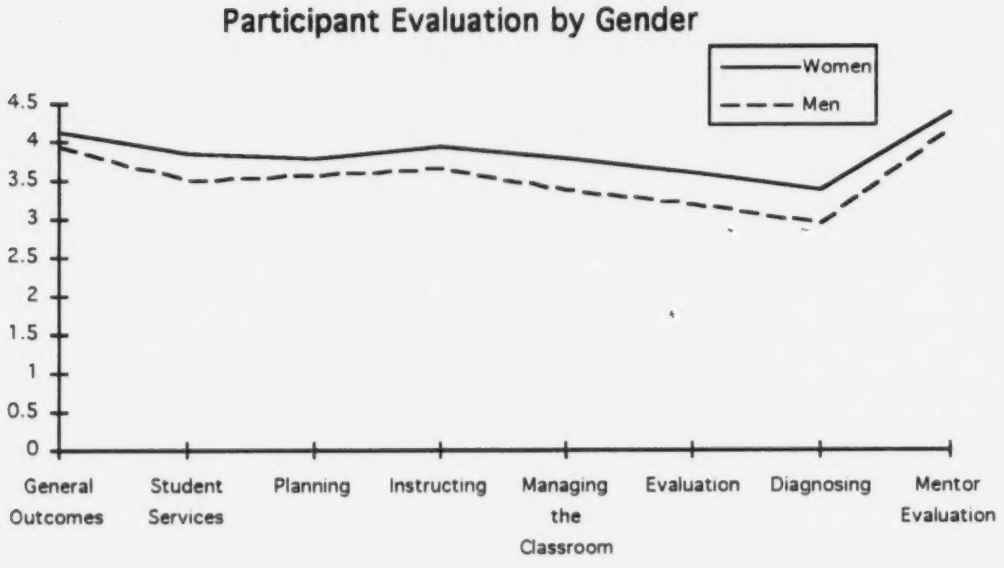


Evaluation by Subject Area. How did science teachers evaluate the Institute compared to mathematics and foreign language teachers? The results show that the profile of scores was parallel. There was a significant difference among the three groups for their perception of classroom management. The significant finding is, however, that

there was little variance in the way these groups of teacher perceived the Alternative Teacher Preparation Program.



Evaluation by Gender. When comparisons were made between women and men who participated in the institute, the results indicated that the women rated the program components higher than the men. The differences were, however, not significant.



References

Hassard, J. and R. Jensen. (1988). *An Alternative Secondary Teacher Training Model: The Georgia Model.* ERIC Clearinghouse on Teacher Education. Document SP030924

National Center for Education Statistics (1992). *A Profile of American Eighth-Grade Mathematics and Science Instruction.* Washington, D.C.: U.S. Department of Education.

Questionnaire

Survey of Graduates of Alternative Teacher Preparation Program

PART I - GENERAL INFORMATION

A. Name _____
Last First Initial (Maiden)

B. Social Security Number _____

C. Present Address _____
Street

_____
City State Zipcode

If you are currently employed, please complete the following:

D. Employer _____

E. Job Title _____

____ Full-Time Position ____ Part-Time Position

F. Place of Work (e.g., company or school building address)

_____
Name Street

_____
City State Zipcode

D. Ethnic background
1. Black 3. Hispanic 5. Other _____
2. White 4. Oriental

E. Gender
1. Female 2. Male

F. Age (as of your last birthday)
1. <25 3. 36-45
2. 26-35 4. >45

G. Area of teaching certification
1. Foreign Language 3. Science
2. Mathematics 4. Other

H. Highest degree held
1. Bachelors 3. Specialist
2. Masters 4. Doctorate

I. Number years of teaching experience
1. 1 3. 3
2. 2 4. greater than 3

J. Total classes taught in area of certification
1. <4 4. 5
2. 4 5. >5
3. 5

K. Total number of non-teaching duties (restroom, cafeteria, etc.) and outside activities (clubs, yearbook, coaching, etc.) involved with during year
1. 0-2 3. 5-6
2. 3-4 4. >6

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L. Level of classes taught the majority of the day
1. Advanced, Honors, AP, Gifted
2. General
3. Basic
4. Non-grouped
5. Other

M. Classification of school
1. Suburban
2. Rural
3. Inner city
4. Urban

N. Predominant Socio-economic status of school
1. Low
2. Lower middle
3. Middle
4. Upper middle
5. High

O. Percentage of Minorities at school
1. <10%
2. 11-30%
3. 31-50%
4. 51-70%
5. >70%

P. Number of students attending school
1. 250-499
2. 500-999
3. 1000-1499
4. 1500-2000
5. >2000

Q. Average class size
1. <10 students
2. 10-20 students
3. 20-30 students
4. > 30 students

R. Material resources available to teachers at your school
1. excellent
2. adequate
3. poor

S. Support (emotional or material) provided by peer teachers
1.. excellent
2. adequate
3. poor

T. Parental involvement and support
1. excellent
2. adequate
3. poor

U. Administrative support received
1. excellent
2. adequate
3. poor

V. College level or staff development courses taken since teacher training
1. 0
2. 1-2
3. 3-4
4. 5-6
5. >6

W. Number of professional organizations which you belong
1. 0
2. 1-2
3. 3-4
4. 5-6
5. >6

X. Number of professional journals read on a regular basis
1. 0
2. 1-2
3. 3-4
4. 5-6
5. >6

Y. Career plans at this time
1. Teach until retirement
2. Teach only few more years
3. Change careers
4. Other

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Survey of Graduates of Alternative Teacher Preparation Program

Part II

Instructions: This part of the questionnaire consists of several statements about general outcomes of instruction and student services as part of the Alternative Certification Program. You are asked to circle the number that best reflects your opinion about each item, using the key at the top of each column.

GENERAL OUTCOMES: How would you rate the instruction you received in the Alternative Certification Program in terms of accomplishing the following general outcomes of your educational program?	1. No Instruction 2. Poor Instruction 3. Fair Instruction 4. Good Instruction 5. Very Good Instruction	
1. Learn a variety of methods for teaching my subject(s).		1 2 3 4 5
2. Learn how social/psychological theories could be applied in professional practice.		1 2 3 4 5
3. Develop competence in teaching as a result of the internship		1 2 3 4 5
4. Develop an understanding of the social contribution teachers can make.		1 2 3 4 5
5. Develop a positive attitude toward teaching		1 2 3 4 5
6. Develop a sense of professional responsibility		1 2 3 4 5

STUDENT SERVICES: How would you rate the quality of the following student services which you used?	1. Very Poor Quality 2. Poor Quality 3. Fair Quality 4. Good Quality 5. Very Good Quality	
1. Academic advising.		1 2 3 4 5
2. Orientation program for the Alternative Certification Program.		1 2 3 4 5
3. Information about educational planning.		1 2 3 4 5
4. Information about career planning.		1 2 3 4 5
5. Procedures for admissions to the Alternative Certification Program.		1 2 3 4 5
6. Class registration procedures.		1 2 3 4 5
7. Registration procedures for student internship.		1 2 3 4 5
8. Individualized interpretation of State Department requirements for teacher certification.		1 2 3 4 5
9. Placement services provided by university.		1 2 3 4 5

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Part III

Instructions: Here is a list of general teaching skills. Circle the number that tells how well you were prepared to do these things, using the key at the top of the column.

PLANNING: How would you rate your preparation

1. No Preparation
2. Poor Preparation
3. Fair Preparation
4. Good Preparation
5. Very Good Preparation

1.	Constructing lesson plans.	1 2 3 4 5
2.	Planning units of study.	1 2 3 4 5
3.	Justifying instructional plans.	1 2 3 4 5
4.	Stating explicit goals and objectives.	1 2 3 4 5
5.	Selecting a model of teaching to fit an instructional goal (e.g. inquiry model)	1 2 3 4 5
6.	Selecting specific teaching procedures to help students attain objectives.	1 2 3 4 5
7.	Finding instructional materials needed to implement plans.	1 2 3 4 5
8.	Selecting instructional materials according to specified criteria (e.g., reading level).	1 2 3 4 5
9.	Selecting instructional methods that match student developmental needs.	1 2 3 4 5
10.	Designing learning experiences to help all students make the most of their abilities.	1 2 3 4 5
11.	Taking account of special needs (e.g., handicapped).	1 2 3 4 5
12.	Sequencing learning experiences to accomplish objectives.	1 2 3 4 5
13.	Designing the classroom environment to promote learning.	1 2 3 4 5
14.	Building motivators into instructional plans (e.g., variety).	1 2 3 4 5
15.	Evaluating an instructional plan according to explicit standards.	1 2 3 4 5
16.	Predicting possible effects of instructional plans.	1 2 3 4 5
17.	Preparing outlines for effective ora. presentation.	1 2 3 4 5

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HOW WOULD YOU RATE YOUR PREPARATION TO DO THESE THINGS?

1. No Preparation
2. Poor Preparation
3. Fair Preparation
4. Good Preparation
5. Very Good Preparation

INSTRUCTING

1.	Using computers in the classroom.	1 2 3 4 5
2.	Using audiovisual equipment in the classrooms.	1 2 3 4 5
3.	Using an effective presentation style.	1 2 3 4 5
4.	Asking different kinds of questions to stimulate different kinds of student learning.	1 2 3 4 5
5.	Giving on-going feedback to guide student performance.	1 2 3 4 5
6.	Modifying plans to deal with unexpected events or student responses (e.g., an interest in pursuing a particular topic).	1 2 3 4 5
7.	Demonstrating principles or procedures.	1 2 3 4 5
8.	Explaining how or why something happened.	1 2 3 4 5
9.	Defining concepts.	1 2 3 4 5
10.	Improving students' questioning and discussion skills	1 2 3 4 5

MANAGING THE CLASSROOM

1.	Providing rewards to motivate students.	1 2 3 4 5
2.	Encouraging self-direction in students.	1 2 3 4 5
3.	Dealing with behavior problems during class.	1 2 3 4 5
4.	Clarifying expectations for student behavior.	1 2 3 4 5
5.	Holding students responsible for their actions.	1 2 3 4 5
6.	Resolving interpersonal conflict.	1 2 3 4 5
7.	Interacting with students who have special needs.	1 2 3 4 5

EVALUATING

1.	Establishing evaluation criteria.	1 2 3 4 5
2.	Interpreting standardized achievement tests.	1 2 3 4 5
3.	Constructing tests to measure student progress.	1 2 3 4 5
4.	Using criterion-referenced tests.	1 2 3 4 5
5.	Reflectively evaluating personal teaching effectiveness.	1 2 3 4 5

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HOW WOULD YOU RATE YOUR PREPARATION TO THESE THINGS?

1. No Preparation
2. Poor Preparation
3. Fair Preparation
4. Good Preparation
5. Very Good Preparation

EVALUATION CONTINUED

6.	Critiquing student performance (e.g., strengths, areas which need improvement).	1	2	3	4	5
7.	Using evaluation results to improve instruction	1	2	3	4	5
8.	Reporting information about students to parents	1	2	3	4	5
9.	Assigning student grades	1	2	3	4	5

DIAGNOSING

1.	Keeping anecdotal records of atypical student behaviors.	1	2	3	4	5
2.	Using a variety of methods to determine student behaviors.	1	2	3	4	5
3.	Integrating information from several sources to determine student needs.	1	2	3	4	5
4.	Determining student developmental level.	1	2	3	4	5
5.	Participating in case conferences with staff.	1	2	3	4	5
6.	Identifying non-instructional factors which may be limiting student progress.	1	2	3	4	5

PART IV

Instructions: This part of the questionnaire consists of several statements evaluating the mentors who were assigned to you as part of the Alternative Certification Program. You are asked to circle the number that best reflects your opinion about each item using the key below.

MENTOR EVALUATION How would you rate the quality of the guidance you received from the mentor assigned to you during your internship?

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

1.	Mentor had a positive and enthusiastic attitude toward his/her job.	1	2	3	4	5
2.	Mentor spent an adequate amount of constructive time with me.	1	2	3	4	5
3.	Mentor displayed an interest in his/her role as a mentor.	1	2	3	4	5
4.	Had positive relationship with mentor.	1	2	3	4	5
5.	Mentor was helpful in planning lessons.	1	2	3	4	5
6.	Mentor gave personal support.	1	2	3	4	5
7.	Mentor gave constructive criticism.	1	2	3	4	5

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MENTOR EVALUATION QUESTIONNAIRE	How would you rate the quality of the guidance you received from the mentor assigned to you during your internship?	1. Strongly disagree 2. Disagree 3. Undecided 4. Agree 5. Strongly agree

8. Mentor provided information of school and system policies. 1 2 3 4 5

9. Mentors should be required for all intern programs. 1 2 3 4 5

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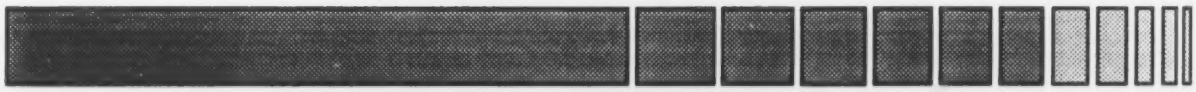

Attitudes of Alternatively Prepared Foreign Language, Mathematics and Science Teachers

Educational Attitudes of Alternatively Certified Teachers

Introduction

The past decade has seen an increase in concerns about the condition of education throughout the nation. The United States, once a world leader in education, suddenly found their students ranked below average. The first reaction was to blame teachers for not doing a better job. This was immediately followed by attacking teacher education programs (Howe, 1988). In order to alleviate this problem many states elected to bypass the regular certification procedures and issue licenses to people who did not have the traditional education background.

The justification for the alternative certification programs is based on the assumption that there are many academically talented individuals who desire a career change (Fox, 1989). It is believed that these individuals would be interested in entering the field of teaching if the financial costs and extensive time required for traditional routes could be minimized. They would bring to the profession knowledge in their subject area as well as experience. The alternative certification program would be able to tap this reserve of qualified individuals and help ease the shortage of teachers in critical areas.

Georgia's Alternative Certification Programs

In 1985 the Georgia Quality Based Education (QBE) Act developed an alternative route to certification. To quality for this program, individuals must: (a) hold a bachelor's degree in a critical need subject area, (b) complete a human growth and development course, (c) complete one year of supervised internship, and (d) pass the Teacher Certification Test (TCT).

In 1988, Georgia State University, in conjunction with the Georgia Department of Education developed a model for an eight-week summer resident program in which twenty-three teacher candidates participated. Upon completion, the teacher trainees

were employed by school districts for the following year and were assigned a mentor who was in the same certified field and in the same school.

The Georgia State University alternative certification program was based on the model developed for the 1988 institute. The Georgia State program consisted of three institutes which were held in the summers of 1989, 1990, and 1991. All three were funded by the Georgia Department of Education to support Alternative Teacher Preparation Institute for secondary mathematics, science, and foreign language teachers. The philosophy and goals of the programs were based on reflective teaching, inquiry teaching, and experimental learning. The institutes were organized as an holistic pedagogical curriculum, and involved the intense interaction among interns and mentors in the public schools. A total of sixty-nine interns completed the institute.

The State Department funded an independent research project designed to evaluate the impact of the Alternative Teacher Preparation Program curriculum on the interns who completed the program and who are now employed as teachers in Georgia. The focus of the study was on the teacher's evaluation of their preparation program, their teaching attitudes, and their perception of the institute.

Alternative Certification

Guyton, Fox, and Sisk, (1991) found similarities between the alternatively certified teachers and the regularly certified teachers. Their study determined that teaching performance at the beginning of the year and at the end of the year was not significantly different. The researchers concluded that "condensed pedagogical preparation and a supervised internship are a reasonable alternative to traditional teacher preparation programs for persons with degrees in the subject they will teach" (p. 7). In a study conducted by the Florida State Department of Education (Educational Standards Commission, 1988), it was found that all the school districts that participated in the state's alternative certification program had positive experiences. The districts described the teachers in the program as enthusiastic, motivated, and found that they had excellent backgrounds in their content areas. Houston, McDavid, and Marshall (1990) found no difference

in alternatively certified and regularly certified teachers in their confidence as teachers, their satisfaction in teaching, or the likelihood of them remaining in the field of teaching after five years.

Teaching Attitudes

Attitudes have been defined as an "enduring structure of descriptive and evaluative beliefs that predispose the individual to behave selectively toward the referents of the attitude" (Kerlinger, 1967, p. 110). Research has shown that the differences between teacher preparation programs and teaching causes attitude changes (Lacey, 1977). Others have determined that the idealistic, progressive, or liberal attitudes that are developed by students during their teacher preparation tend to shift to more traditional, conservative, or custodial view during their first years of teaching (Veenman, 1984; Hoy & Woolfolk, 1990; Kagan, 1992). Veenman (1984) found that teachers encounter pressure from colleagues, administrators, students, and parents to conform to the accepted norms of the school. The greater the difference between the school reality and the ideals established during teacher training, the greater there is an attitude change toward a conservative direction.

Bunting (1984, 1985) developed the Educational Attitudes Inventory which uses two scales to describe teaching attitudes; student-centered and directive teaching views. Student-centered attitudes are characterized by focusing on the emotional as well as the cognitive aspects of the students. Teachers with high scores on this scale support an emphatic relationship with the students allowing more student interaction in the classroom. The directive scale emphasizes the focus of the teacher in the educational process. A high score on this scale is indicative of a teacher who believes in being in control of the decisions and learning process. In a study comparing regularly certified teachers with alternatively certified teachers, Fox (1989) found that significant changes occurred in the attitudes of the teachers. In both groups there was an increase in the teacher-centered scores from the beginning of the year to the middle of the year.

Not all studies support this change in teaching attitudes. Zeichner and Tabachnick (1981; 1984) found that the first year of teaching did not necessarily result in a substantial change in

teaching attitudes. McArthur (1981) observed an increase in custodial attitudes during the first year of teaching was followed by a plateau period over the next four years.

Method

Subjects

The subjects of the study are 69 teachers who participated in the Georgia Alternative Preparation Program during the years of 1989, 1990, and 1991. The teachers held a minimum of a bachelor's degree in the fields of mathematics, science, and foreign language, or engineering before entering the program. Seven of the participants held masters degrees and two had doctorate degrees. Data for program participants were collected by a survey which included an evaluation of the teacher preparation program, an attitudinal inventory, and demographic questions including ones regarding teaching experience, future plans, and teaching context. After the results were tabulated, four teachers were interviewed in order to assess further the attitudes of the teachers as well as the success of the program.

The summer institute of 1989 had 24 teacher trainees, 10 in mathematics, 7 in science, and 7 in foreign language. At the beginning of the summer, 11 of the participants were employed for the fall and assigned mentors. The mentors were involved in two weeks of training including a one week residential session in which the mentors worked directly with the interns. At the end of the summer session, 22 of the 24 interns held teaching positions for the fall. One of the interns chose not to enter teaching at this time, and the other one was hired during the fall quarter.

The summer institute of 1990 had a total of 23 participants, five in mathematics, ten in science, and eight in foreign language. Of this group, 22 of the teacher trainees had teaching positions for the 1990-1991 school year. Mentors were assigned to the teachers once they were in a school. Twenty out of the 22 returned to teach for the 1991-1992 school year. The two who did not return made plans to go to graduate school to pursue advanced degrees.

The summer institute of 1991 had 22 participants, eight in

mathematics and fourteen in the field of science. There were no participants in area of foreign language. The total numbers of the participants are shown in Table 1.

Table 1

Total Number of Participants in each Subject Area and Year

Year	Mathematics	Science	Foreign Language	Total
1989	10	7	7	24
1990	5	10	8	23
1991	8	14	0	22
Total	23	31	15	69

There were a total of 27 females and 22 males who participated in the three institutes. A complete summary of the numbers of teachers with regards to their sex and content area can be seen in Table 2.

Table 2

Number of Participants by Sex and Subject

Sex	Mathematics	Science	Foreign Language	Total
Male	9	11	2	22
Female	14	20	13	47
Total	25	30	14	69

Collection of the Data

During the summer of 1992, teachers who participated in the Georgia State University Alternative Certification Programs were identified and mailed an introductory letter to explain the nature of the research. The instrument package was mailed to the home address during the fall term. The instrument packet included the following: (a) the General Information section used to collect the demographic and school context data; (b) the Survey of Graduates of Alternative Teacher Preparation Program; and (c) the Educational Attitudes Inventory.

The institute participants were identified by the use of a code number. After the results were analyzed the researcher separated the attitude inventories into the following four categories; (a) high student-centered, (b) low student-centered, (c) high teacher centered, and (d) low teacher-centered. One individual was randomly selected from each of the categories for a follow-up interview. Each of the four teachers were asked five open-ended questions and their responses were recorded on tape for evaluation.

Instruments

Survey of Graduates of Alternative Teacher Preparation Program

The Survey of Graduates (SGATP) instrument is an objectively scored paper and pencil questionnaire which was based on the Survey of Graduates developed at the University of Minnesota (Hummel & Strom, 1987). It is composed of 47 items designed to evaluate the teachers' perceived rating of different areas of their teacher preparation program. The survey is divided into five areas which fall under the category of pedagogical knowledge. These skills and the number of items ranked under each include (a) instructing-10 items; (b) managing the classroom-7 items; (c) evaluating-9 items; (d) diagnosing-6 items; and (e) planning-17 items.

In addition to rating the pedagogical knowledge received, the instrument has six items on general outcomes which asks questions on topics such as attitude and professionalism and nine

items on student services. The item responses are in the form of a Likert type scale with a five-point continuum of point values: very good instruction (5), good instruction (4), fair instruction (3), poor instruction (2), and no instruction (1). The scores on the SGATP range from a maximum score of 365 to a minimum score of 73. A cover sheet on the questionnaire was used to collect information about the participants' demographics as well as school context factors.

Educational Attitudes Inventory

The Educational Attitudes Inventory (EAI) designed by Bunting (1984) describes student-centered and directive teaching views by the use of two factor-analytically derived scales. Bunting (1988) found that there was a low correlation between the student-centered and directive scales and suggests that the views are independent of each other. This indicates that teachers may simultaneously hold both views. Bunting (1988) distinguishes between the two scales:

> The Student-Centered Scale focuses on the emotional and cognitive dimensions of development in addition to the role of relevancy in the curriculum. Teachers who score high on the scale believe in the importance of emphatic supportive relationships which free students to discuss their feelings and experiences. They also believe that students should be actively involved in learning through opportunities to predict, infer, generalize, and evaluate. These teachers also think that students learn more effectively when the curriculum is related to concerns and experiences beyond the classroom. The Directive Scale centers on the responsibility of the teacher in the educational process. Teachers who score high on the scale believe it imperative that teachers, rather than students, be in control of decisions and processes related to education. Firm discipline, attention to order and procedure, and teacher-controlled curricula are basic elements of this perspective. (p. 44)

Responses to the items on the EAI are in the form a Likert type scale with a five-point continuum of options. Point values range from the following: strongly agree (5), agree (4), uncertain (3), disagree (2), and strongly disagree (1). The directive scale has a total of 15 items with a maximum score of 75 points while the student-centered scale has 19 items for a total of 95 points. Split-half reliability values computed for the two scales range from .73 for the directive scale to .89 for the student-centered scale (Bunting, 1984).

Bunting found that variations in the experiences and classroom decisions of teachers have a predictability related to a three-tiered scoring classification:

Student-Centered Scale	Directive Scale
(95 point maximum)	(75 point maximum)
Hi-minimum score of 80	Hi-minimum score of 60
Mod-minimum score of 60	Mod-minimum score of 52
Lo-minimum score of 40	Lo-minimum score of 30

Treatment of the Data

The first hypothesis stated that a significant change has occurred in the scores on the directive scale or the student-centered scale of the EAI between the first year and third years of teaching. The difference between the two means was tested by dependent *t* tests due to the small sample size and the use of repeated scores. A significance level of .05 was used.

The second hypothesis stated that there is a significant relationship between the teacher's scores on the Survey of Graduates of Alternative Teacher Preparation Program and their scores on the directive or the student-centered scales of the Educational Attitude Inventory. The variable of teacher preparation evaluation involves the perception of how well the institute prepared the participants for their role as a teacher. A total score was calculated from each of the seven sections on the SGATP and correlated with the scores on each scale of the EAI. Pearson's correlation coefficient was used to determine if there was an relationship. Normal distribution is assumed to underlie all three scales.

Hypothesis three states that there is a significant difference in the teacher's assessment of mentoring and their scores on the EAI. To assess the relationship between the teacher's attitudes and their evaluation of their mentor, a Pearson's correlation coefficient was used. This statistical technique correlated the total scores of the teacher's evaluation of their mentors and the scores on the scales of the EAI.

Hypothesis four states that school context and teaching commitment have a significant relationship to the attitudes of teachers in their first years of teaching. This hypothesis was subdivided into two separate testable hypotheses. To determine if there was a relationship between school context and teaching attitudes a contingency table was constructed and a chi square statistical test used to test for a relationship between the school context variables and the scores on the EAI. Each item contained between four and five categories. The chi square was chosen because it is a nonparametric statistical procedure and the school context variables are categorical measures with no underlying distribution assumed. The areas of school context investigated are shown in Table 3.

Table 3

School Context Variables

Variable	Number of Categories	Classification
Class level	4	Adv. Gen. Basic Non-grouped
School Locale	4	Suburb, Rural, Urban, Inner-city
SES	5	Low, L-med, Med U-med, High
% Minorities	5	<10, 11-30,31-50, 51-70, >70
School Size	5	250-499, 500-999, 1000-1499,1500-2000, >2000
Class Size	4	<10, 10-20, 20-30 >30
Material Resources	3	Excellent, Adequate, Poor
Peer Support	3	Excellent, Adequate, Poor
Parental Support	3	Excellent, Adequate, Poor
Administration Support	3	Excellent, Adequate, Poor

The chi square statistical test was also used to determine if there is a relationship between teaching commitment, which contains three categories and teaching attitudes. The directive and student-centered scores on the EAI was used as the dependent variable.

There was no significant change found in the attitudes of teachers from the first year to the third year of teaching on the student-centered scale of the EAI, $t(14) = 0.835$, $p<.418$. There was also no significant change in the attitudes of teachers from the first year to the third year of teaching on the teacher-centered (directive) scale of the EAI, $t(14) = -1.086$, $p<.297$. Results can be seen in Table 4.

Table 4
Mean Scores and t Tests for Determining
Changes in Teaching Attitudes From the First Year
to the Third Year of Teaching

EAI Scales	Average of 4 First-year Scores	Third-year Score	t	p
Student-centered	85.6	83.4	.835	.418
Teacher-centered	41.6	40.7	-1.086	.297

While not significant, the mean paired scores on the student-centered scale showed a drop from the beginning of their first year to the end of the first year. By the third year the average scores slightly higher though not significantly. The teacher-centered scores showed a similar inverse trend with the scores increasing as the student-centered scores decreased. The mean scores for the first and third years can be seen in Table 5.

Table 5

Mean Scores on the Subscales of the EAI from the First Year to the Third Year

Subscale	Beginning of 1st Yr	End of 1st Month	End of 5th Month	End of 1st Year	3rd Month of 3rd Yr
Student-Centered	87.5	89.4	83.7	81.8	83.4
Teacher-Centered	43.2	36.2	42.7	44.2	40.7

Total number in sample = 14

While no significant change was found, this study indicated a trend in the changing and stabilization of attitudes of teachers in their first years of teaching. The means and standard deviations of the subdivided pedagogical areas on the Survey of Graduates of Alternative Teacher Preparation Program (SGATP) are reported on Table 6.

Table 6

Means and Standard Deviations of Pedagogical Areas on the Survey of Graduates of Alternative Teacher Preparation Program

Pedagogical Areas	Number of Subjects	Average Score	Standard Deviation
General Outcomes	40	4.08	4.43
Student Services	39	2.73	10.05
Planning	36	3.68	11.60
Instructing	40	3.86	7.23
Classroom Management	40	3.64	6.16
Evaluating	40	3.42	9.00
Diagnosing	40	3.13	7.71

A significant positive relationship was found between student-centered attitudes and the degree of preparedness in instruction, $r(40) = .36$, $p<.020$, leading to the acceptance of the student-centered section of subhypotheses four. This finding indicates that being well prepared in instructing has a positive influence on student-centered teaching attitudes.

With the exception of preparedness in instructing, no aspect of teacher preparation program evaluation had a significant relationship with teaching attitudes (Table 7). It is important to note however, that though not significant, a trend can be detected which supports a previous study. Fox (1989) found a significant relationship between teaching attitudes and evaluation of teacher preparation and concluded that teachers with lower student-centered attitudes and higher teacher-centered attitudes tended to give lower ratings to their teacher preparation program. Conversely, teachers who scored higher on student-centered

attitudes and lower on teacher-centered attitudes were more favorable on how well they were prepared to teach. In this study, the same trend was detected.

Table 7

Correlation Table: Student-Centered and Teacher-Centered Attitude Scores with Evaluation of the Alternative Certification Teacher Preparation Program

Teacher Preparation Evaluation	Student-Centered Scores	Teacher-Centered Scores
General Outcomes	.099	-0.244
Student Services	.213	-0.137
Planning	.287	-0.289
Instructing	.365*	-0.260
Managing	.183	-0.143
Evaluating	.116	-0.189
Diagnosing	.117	-0.167

*Correlation coefficients significant at the .05 level.

No significant correlation was found between the alternatively certified teacher assessment of mentoring and their scores on the student-centered items of the EAI, $r(36) = 0.015$, $p<.929$. No significant correlation was found between the alternatively certified teacher assessment of mentoring and their scores on the directive (teacher-centered) items of the EAI, $r.(36) = .167$, $p<.328$. The results are represented in Table 8.

Table 8
Correlation of the Alternative Certified Teachers Assessment of Mentoring and their Scores on the Student-Centered and Directive Items of the EAI

Subscale	r	df	p
Student Centered	0.015	36	0.929
Teacher-Centered	0.167	36	0.328

The lack of significance of mentoring found in this study could be due to several factors. Not all of the teachers who participated in the study were assigned mentors. In some cases the mentors were in different subject areas and peer teachers provided more of the support. Also, it is possible that due to the fact that these teachers have been on their own for several years may have diminished the impact of having a mentor.

Table 9

Chi Square Tests for School Context Variables and Student-Centered and Directive Teaching Attitudes

Attitude and School Context	n	df	X^2	p
Class Level				
Student-Centered	40	6	7.822	0.251
Directive	36	6	8.682	0.192
School Locale				
Student-Centered	40	4	2.987	0.560
Directive	36	4	1.197	0.879
SES				
Student-Centered	40	5	8.765	0.119
Directive	36	5	3.600	0.608
% Minorities				
Student-Centered	40	4	3.263	0.515
Directive	36	4	5.426	0.246
Number Students				
Student-Centered	40	5	4.729	0.450
Directive	36	5	.909	0.970
Mean Class Size				
Student-Centered	40	4	4.611	0.330
Directive	36	4	0.814	0.936
Resources				
Student-Centered	40	4	2.865	0.581
Directive	36	4	2.118	0.714
Peer Support				
Student-Centered	40	2	0.768	0.681
Directive	36	2	1.513	0.469
Parental Support				
Student-Centered	40	3	1.411	0.703
Directive	36	3	3.747	0.290
Admin. Support				
Student-Centered	40	2	4.183	0.124
Directive	36	2	3.328	0.189

Although research has shown the relationship between school context and the attitudes of teachers (Guyton and McIntyre, 1990; Levin and Ammon, 1991; Zeichner and Tabachnick, 1984), this study found no significance. Fox (1989), also found that with the exception of administrative support, school context was not significantly related to teaching attitudes. She suggests that in the beginning, teachers are not as influenced by these variables as are more established teachers. This may also be the case with the participants of this study. It may also be possible that since these

were provisionally certified teachers, they were given more supervision and support than other first year teachers. Though no significance was found, the teachers interviewed all agreed that the level of the students (advanced, general, etc.) influenced their attitudes toward teaching.

To test the relationship of teaching commitment to the attitudes of teachers, the student-centered items were collapsed into three categories; (a) high student-centered (>79), (b) moderate student-centered (60-79), and (c) low student-centered (< 60). Since none of the teachers had scores below 60, this category was not used. The variable of teaching commitment was divided into four categories; (a) teach until retirement; (b) teach only a few more years, (c) change careers; and (d) other plans. The items on the teacher-centered scale were also collapsed into three categories; (a) high teacher-centered (>59); (b) moderate teacher-centered (52-59); and (c) low teacher-centered (<52). None of the teachers in the study scored above 59 so the high teacher-centered category was deleted. Table 10 provides a summary of the student-centered and teacher-centered scales and their percentages.

Table 10
Percentages of Student-Centered and Teacher-Centered Subscales on the EAI

Categories	Student-Centered	Teacher-Centered
High	62.5%	0%
Moderate	37.5%	5.6%
Low	0%	94.4%

Proposed teaching commitment revealed no significant relationship with student-centered attitudes nor between teacher-centered attitudes. The results of the chi square test are shown in

Table 11.

Table 11
Chi Square Test for Teaching Commitment with Student-Centered and Teacher-Centered Attitude Scores

Subscale	n	df	X^2	p
Student-Centered	40	2	1.458	0.482
Teacher-Centered	40	2	1.625	0.444

This study found that thirty-seven and a half percent of the teachers indicated that they plan to teach until retirement, twenty-five percent plan to teach only a few more years and thirty-seven and a half percent plan to change careers. In discussing career plans with the teachers interviewed, some discrepancy was found between how they responded on the survey and their actual plans. Only one of the teachers interviewed indicated on the survey that they plan to teach until retirement. In actual conversation, three of the four plan to continue teaching and only one plans to change to counseling. This indicates that the choices on the survey may have not been clearly stated and the results are not indicative of the teachers' actual teaching plans.

Results of Interviews

The two teachers who scored the highest on the student-centered scale and the two teachers who scored the highest on the teacher-centered scale were selected to be interviewed. The interviewees included two males and two females. Two were in science and two taught mathematics. The questions asked were as follows:

1. In what areas did the institute best prepare you for the teaching profession?
2. In what areas were you the least prepared for your role as a teacher?
3. How has the school environment affected your attitude toward teaching?

4. What are your long-term career plans and what has influenced your decision?

5. What advise or recommendations can you make for future designs of teacher preparation programs?

In the first question, all of the teachers agreed that the hands-on experience provided by the institute was the most helpful in preparing them to teach. There was no agreement on the area that was the least helpful. Responses to the second question included role-playing, lesson planning, and the lack of information in the area of human growth and development. For the third question, the teachers were consistent in identifying their own teaching attitudes and all believed that the level of the class (advanced, general, basic, etc.) influenced their teaching attitudes. They agreed that in the advanced classes teachers can be more student-centered while the lower level classes needed more structure. One teacher added that the subject taught also played a role in determining teaching attitudes.

The question concerning career plans found that all of the teachers plan to remain in the field of education but not all in the classroom. Of the four interviewed, two plan to continue teaching on the secondary level, one plans to teach on the college level, and one is going into counseling. The final question received a variety of responses. A couple of the teachers felt that teacher preparation programs should provide more opportunities for the teachers to work directly with students. Another teacher suggested that the programs should be less theoretical and should provide more opportunities in dealing with real classroom situations.

Summary and Conclusions

The United States, once known for the quality of education has suddenly found their students ranked below average, especially in the fields of mathematics and science. One of the areas targeted was the lack of qualified teachers in these critical fields. In order to alleviate this problem, many states, including Georgia developed alternative teacher preparation programs which would bypass the traditional route. These programs were designed to attract college graduates with strong academic backgrounds into the teaching profession. The concept of alternative certification is relatively new and limited research has

been done to determine how successful these teachers are in the classroom.

While there was no significant change in attitudes from the first to the third year of teaching on either the student-centered or teacher-centered subscale of the Educational Attitudes Inventory, certain patterns were detected. The teachers' student-center score dropped during the first year then had stabilized by the third year at a slightly higher level. The teacher-centered scores had a similar but inverse trend. This is consistent with previous studies which were discussed in chapter 2. The results from this study indicate that though not significant, alternative certified teachers' attitudes become slightly more traditional during the first year of teaching and then levels out by the third year. It is important to note that even though there was a decrease in the student-centered scores, 62.5% of the teachers were still classified as high with 37.5% classified as moderate. None of the teachers in the study fell into the low student-center category. The Georgia Alternative Teacher Preparation Program focuses on preparing progressive, student-centered teachers. It is possible that the teaching attitudes developed in this program have remained with the teachers.

A significant positive correlation was found between student-centered attitudes and the evaluation of the area of instructing in the teacher preparation program. Teachers who scored high on the student-centered scale felt that they were well prepared the area of instructing in the classroom. These results are consistent with the definition of a student-centered teacher. Teachers with these attitudes encourage more interaction with the students and accomplish this by engaging the students with questions which stimulate reactions by providing constant feedback, and by being able to modify the plans to incorporate a particular area of interest. The instructing section of the GSATP specifically asked the participants to evaluate how well they were prepared to ask questions to stimulate different kinds of student learning, their preparation in modifying plans to deal with unexpected student responses or events, and their preparation in improving students' questioning and discussion skills While no significant relationship was found between the other sections of the teacher preparation evaluation with teaching attitudes, a trend can be detected which supports a previous study. Teachers who scored higher on the student-centered scale and lower on the

teacher-centered scale were more favorable in rating their teacher preparation while the reverse was indicated with teachers who scored higher on the teacher-centered scale. This indicates that the teachers with high student-centered attitudes felt that they were better prepared to teach than the teachers with more teacher-centered attitudes.

No significant correlation was found between the alternatively certified teachers' assessment of mentoring and their scores on the student-centered or the directive (teacher-centered) scales of the Educational Attitudes Inventory. In an earlier study, Fox (1989) had found that teachers who reported receiving support during the first months from a mentor exhibited higher student-centered attitudes and lower teacher-centered attitudes. The lack of significance found in this study may be due to the fact that these teachers have been on their own for one to three years without a mentor. It has been shown that teachers find mentoring less important as the years pass (Guyton, Fox, and Sisk, 1991). It may be possible that this post hoc evaluation of mentoring had some affect on the correlation.

The school context variables did not appear to relate significantly to the attitudes of teachers in their first three years of teaching. The literature indicates that these variables have been found to exert an influence on teaching attitudes. In a previous study Fox (1989) found similar results and suggests that initially teachers' attitudes are more influenced by intrinsic basic survival factors rather than external ones. Fox goes on to speculate that as the teachers become accustomed to the teaching role, these factors will have a more significant influence on the attitudes. The participants in this study have less than five years of teaching experience. It is possible that they are still in the intrinsic mode. While no significance was found, all of the teachers interviewed suggested that the level of the student influenced whether they would use a student-center or teacher-centered approach in the classroom. They agreed that the more advanced the students were the more student-centered they became in their teaching attitudes. On the other hand, the teachers who were interviewed felt that the lower level students needed more structure.

Proposed commitment to remain in the field of teaching revealed no significant relationship with either student-centered

attitudes nor teacher-centered attitudes. It was proposed in the literature (Camp and Heath-Camp, 1991) that by attracting people into teaching from other fields would provide more maturity and stability in the classroom. Heath-Camp, Camp, and Adams-Cosmis (1990) found that the alternatively certified teachers were more likely to continue teaching after 3 years. This study did not support those finding. All though 37.5% of the teachers indicated that they plan to teach until retirement, 25% plan to teach only a few more years and 37.5% plan to change careers. While none of the teachers interviewed selected the survey response that they planned to teach until retirement, all indicated that they planned to remain in the educational field. Two of the four responded that they planned to remain in the classroom. The other two plan to change to college level or counseling. It is possible that the choices on the survey were confusing and that the results are not indicative of the teachers' actual teaching plans.

This study concludes that the Georgia Alternative Teacher Preparation Program is producing teachers who have high or moderate student-centered teaching attitudes. None of the teachers prepared through the alternative teacher preparation program scored high on the teacher-centered scale of the Educational Attitudes Inventory. These teachers felt that they were well-prepared in the area of instructing in the classroom which concentrates on the engagement of the students. Instructing is probably the most important aspect of teaching and this study found that area to be the strength of the Georgia Alternative Preparation Program. This study also found that the attitudes of the teachers who were prepared through this program were not affected by any of the teaching context variables. The alternative preparation program at Georgia State University emphasizes both direct instruction as well as cooperative learning. Having received training on both approaches to teaching may have enabled the teachers to overcome the context variables resulting in little change in their teaching attitudes.

Recommendations

Based on the aforementioned conclusions, the following recommendations are made:

1. The lack of change in teaching attitudes is not consistent with the literature and justifies further study. It is recommended

that a longitudinal study continue with the teachers from this program to determine if their teaching attitudes remain at this level over a long period of time.

2. More information is needed on the influence of the school context variables. The homogeneity of participants in this study may have affected the significance of the results. It is recommended that future studies incorporate a larger population in order to focus on the impact that these variables have on the attitudes of teachers.

3. The study should be expanded to include the relationship of teaching attitudes to the actual engagement of students within the classroom. The teachers who were interviewed described themselves as either student-centered or teacher-centered but would later contradict this characteristic in given situations. A qualitative study of two to four teachers would be able to provide much needed data on teaching attitudes in an actual classroom environment.

4. A study should be conducted to compare the longevity of alternatively certified teachers with those who were regularly certified to determine if these teachers are remaining in the classrooms.

5. It is recommended that the Georgia Alternative Teacher Preparation Program continue preparing teachers. Based on the results of this study, the program has been successful in producing teacher's with high to moderated student-centered attitudes who have remained in the classroom for up to 3 years.

References

Bunting, C. E. (1984). Dimensionality of teacher education beliefs: An exploratory study. Journal of Experimental Education, 52(4), 195-198.

Bunting, C. E. (1985). Dimensionality of teacher education beliefs: A validation study. Journal of Experimental Education, 53(4), 188-192.

Bunting, C. E. (1988). Cooperating teachers and the changing views of teacher candidates. Journal of Teacher Education, 39(2), 42-46.

Camp, W. & Heath-Camp, B. (1991). On becoming a teacher: "They just gave me a key and said 'Good Luck'". National Center for Research in Vocational Education, Berkeley, CA.

Education Standards Commission (1988). Teachers for Florida's classrooms: The experimental alternative certification program for secondary teachers. Report and recommendations. Tallahassee: Florida State Department of Education.

Fox, M. C. (1989). A study of educational attitudes of alternatively certified and traditionally certified beginning teachers. Unpublished doctoral dissertation, Georgia State University.

Guyton, E., Fox, M., & Sisk, K. (1991). Comparison of teaching attitudes, teacher efficacy, and teacher performance of first year teachers prepared by alternative and traditional teacher education programs. Action in Teacher Education 13(2), 1-9.

Guyton, E., & McIntyre, D. J. (1990). Student teaching and school experience. In W. R. Houston (ed.). Handbook of Research on Teacher Education. New York: Macmillan.

Heath-Camp, B., Camp, W., & Adams-Casmis, E. (1990). The induction of marketing teachers: Case studies. Paper presented at the American Vocational Association Convention, Cincinnati, OH.

Houston, W. R., McDavid, T., & Marshall, F. (1990). A study of 300 first-year teachers and their mentors, 1989-90. Houston, TX: Houston Independent School District.

Howe, A. C. (1988). Current issues in science teacher education. Clearing House, 61(7), 309-311.

Hoy, W., & Woolfolk, A. (1990). Socialization of student teachers. American Education Research Journal, 27(2), 279-300.

Hummel, T. J. and Strom, S. M. (1987). The Relationship between teaching experience and satisfaction with teacher preparation: A summary of three surveys. Journal of Teacher Education, 38(6), 28-36.

Kagan, D. M. (1992). Professional growth among preservice and beginning teachers. Review of Education Research, 62(2), 129-169.

Kerlinger, F. N. (1967). Social attitudes and their critical referents: A structural theory. Psychological Review, 74, 110-121.

Lacey, C. (1977). The socialization of teachers. London: Methuen.

Levin, B.B, & Ammon, P. (1991). Toward an understanding of teacher development: A longitudinal case study of four teachers. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

McArthur, J. (1981). The first five years of teaching. Canberra: Australian Government Publishing Service.

Veenman, S. (1984). Perceived problems of beginning teachers. Review of Educational Research, 54(2), 143-178.

Zeichner, K. M., & Tabachnick, R. B. (1981). Are the effects of university teacher education washed out by school experience? Journal of Teacher Education 32(3), 7-11.

Zeichner, K. M., & Tabachnick, B. R. (1984). Individual and institutional influences in the development of teacher perspectives. In Tabachnick, B. R. & Zeichner, K. M. The development of teacher perspectives: Final report. Madison, WI: Wisconsin Center for Education Research.

7

Concerns Facing Alternatively Certified Teachers in Science

Concerns Facing Alternatively Certified Teachers in Science

Introduction

The problems and challenges facing first year teachers have been well documented over the past several years (Veenman, 1984; 1987; Gomez and Comeaux, 1990; Pigge and Marso, 1992; Boccia, 1989). Research has suggested that new teachers are not sufficiently able to handle the demands and complexities they encounter as they enter the classroom. Even though a wide range of problems are evident from the literature, there are some core problems common to most studies. Veenman (1987) reviewed some 91 studies pertaining to problems of beginning teachers and found that the most frequently mentioned issues were (1) managing and controlling the classroom, (2) motivating students, (3) handling differences among students, (4) evaluating student work, and (5) dealing with parents. He found little difference between elementary and secondary teachers, older studies and newer studies, novice teachers and experienced teachers, one country verses another country or between teachers emerging from different types of training programs (Veenman, 1984).

Even though problems identified were similar for new and experienced teachers, the frequency of the problem tended to reduce with experience. However Adams (1982) found that problems related to administrators and parents increased with teaching experience and that disciplinary and motivational problems did not decrease during the first five years of teaching.

Boccia (1989) found that the following classroom concerns ranked high to very high in a group of 32 neophyte teachers; (1) relevance of subject matter to students, (2) rapport with students, (3) classroom control, management and discipline, (4) personal knowledge of adolescent development, behavior and learning, (5) lesson planning and, (6) knowledge of subject matter and curriculum materials. The same group

rated relations with parents as the number one problem outside the classroom. Gordon (1991) compared a group of recent studies and found that the same items tend to appear at the top of the lists.

Because of the progression in science teaching and especially the new emphasis on process skills, critical thinking and constructivism a new concern has surfaced: The discrepancy between the convictions of the teacher and the constraints placed on him or her by administrators, curriculums and peers. For example, an idealistic new teacher may wish to run a more open science classroom emphasizing student centered learning and the development of critical thinking skills. As the principal or supervisor happens to walk by and observe the class, the impression may be that chaos abounds and that the new teacher is not imparting his or her storehouse of knowledge to the class. The administrator criticizes the teacher either verbally or tacitly and the teacher's enthusiasm wanes. The effort to open the educational process has seemingly failed, not because of the methodology, but because the novice did not have the experience to properly execute the idea to the satisfaction of all concerned. In addition, curriculum constraints require covering certain specified topics since, among other considerations, they are included on the college board exams and achievement tests. And college professors too clamor for the inclusion of more and more subject themes in upper level science because incoming freshman appear weak in certain areas. Experienced curriculum developers, administrators and peers tend to be guardians of the status quo and eschew the informal "messing about" kind of science becoming more and more popular. Brickhouse and Bodner (1992) have done a two year case study illustrating the struggle new teachers face when their philosophy conflicts with that of bureaucracies and institutions (see also King, 1991).

Fuller (1969) suggested a three-stage model related to concerns of aspiring teachers during their training program. In the initial stage, teachers tend to focus on concerns related to

self, such as whether students offer respect or whether time is managed effectively. In the second stage, after the first is somewhat resolved, the concerns become task oriented, such as concerns about duties and responsibilities or whether sufficient clerical help is available. As these are resolved a third stage of concerns is entered, the impact stage. This stage is characterized by concerns related to the impact or affect of the teaching style on the students. Examples of this type of concern are anxiousness over the extent to which the teacher is helping the student value learning or whether students can apply what they learn. For Fuller, as the teacher matures, the concerns expressed tend to move through a developmental process from self to task to impact. Hall (1979) discovered that it takes about five years for teachers to move from the self stage to the impact stage.

This report focuses on the concerns and challenges facing the alternatively certified beginning science teacher and the relationship of these challenges to the three stages of development: self, task and impact as suggested by Fuller (see also Borich, 1988; 1992).

Procedures

Subjects

The subjects of this study were 15 science teachers who participated in the Georgia Alternative Preparation Program offered in the successive summers of 1989, 1990 and 1991. Each teacher held a minimum of a bachelors degree in some area of science or engineering. A survey related to teacher concerns was sent to each with 13 being completed and returned. In addition six teachers were personally interviewed to establish pertinent information regarding their concerns and challenges and to help assess the alternative program at large.

Data Collection

In the spring of 1992, science teachers who participated in the alternative program and who had returned surveys including an evaluation of the ACT Program and demographics questionnaire, were sent an explanatory letter and a concerns survey called the Teacher Concerns Checklist (Borich, 1988). Of the 15 surveys mailed, 13 were returned. Of these, six were selected randomly to be interviewed in order to better pinpoint their challenges and concerns as they entered the classroom and after some teaching experience.

The Teachers Concerns Checklist

The Teacher Concerns checklist was initially developed by Fuller and Borich (Borich, 1988) and used by this study. An updated version with minor changes was subsequently validated as reported by Rogan, Borich and Taylor (1992). The questionnaire is a 45 item instrument with 15 items for each phase of the Fuller model: self, task and impact. The items are randomly distributed in a 45 item checklist. Respondents are asked to consider each and record on a scale of 1 to 5 their level of concern for that item. Each item is a statement that expresses a concern teachers may have as they experience the profession. A response of 1 indicates not concerned , 2 indicates a little concern, 3 moderate concern, 4 denotes very concerned and 5 suggests total preoccupation (Figure 1).

The items on the checklist are grouped according to the following designation:

Self	Task	Impact
2	1	5
4	3	15
8	6	17
9	7	19
13	10	22
14	11	23
18	12	29
20	16	34
24	21	36
26	25	37
28	27	38
30	31	39
32	33	41
35	40	43
44	42	45

Examples of Self items are:

2. Whether the students respect me.
4. Doing well when I'm observed.

Examples of Task items are:

1. Insufficient clerical help for teachers.
3. Too many extra duties and responsibilities.

Examples of Impact items are:

5. Helping students to value learning.
15. Increasing student's feelings of accomplishment.

Personal Interviews

Interviews were conducted to allow respondents opportunity to clarify their attitudes toward the alternative program and detail their perceived concerns upon both entering the classroom and after one to two years experience.

Interviews were given to six randomly selected individuals who had returned both their initial questionnaires and surveys, as well as the Teacher Concerns Checklist. Subjects were interviewed at their place of work and permission was asked for and granted to tape record all relevant proceedings. Questions were open-ended allowing for maximum unprompted responses. The following is a list of the questions that were asked. Occasionally questions were modified to allow for the flow of the interview, but the essential elements represented here were covered with each individual.

Interview Questions

1. Looking back on your first year of teaching, what would you describe as the most positive aspects of this experience? In what ways did the institute prepare you best?

2. What were the most negative aspects?

3. What were the most difficult concerns you encountered or adjustments you had to make? Did the institute address these concerns? If not, how can the institute be modified in order to meet the needs of future interns?

4. At the beginning of the school year, what do you believe to be your greatest teaching strengths and weaknesses?

5. In which areas have you made the most improvement?

6. Are there professional competencies where you may need improvement?

7. In what ways have the requirements of the alternative program been of most benefit? Of least benefit?

8. Do you want to continue teaching?

9. What are your recommendations for making the alternative program more valuable to future interns?

Results

Frequencies of all 45 items from 13 questionnaires were tabulated and the means calculated for each question. Results were as follows:

	Self	Task	Impact
Item	2. 2.85	1. 1.85	5. 3.85
	4. 2.69	3. 3.08	15. 3.15
	8. 2.77	6. 3.08	17. 2.62
	9. 1.23	7. 1.77	19. 3.62
	13. 1.77	10. 2.62	22. 3.00
	14. 1.46	11. 2.23	23. 3.31
	18. 2.00	12. 2.69	29. 2.77
	20. 2.62	16. 2.00	34. 1.92
	24. 2.31	21. 2.85	36. 2.69
	26. 2.62	25. 3.15	37. 3.15
	28. 2.69	27. 2.69	38. 2.69
	30. 2.31	35. 1.69	39. 2.69
	31. 2.39	40. 2.23	41. 3.00
	32. 1.46	42. 2.46	43. 3.15
	33. 2.23	44. 1.77	45. 2.85
$\bar{X}$ =	2.23	2.41	2.96

The above means indicate that as a group this sample tends to place more emphasis on impact type concerns than on self or task items.

Results from Interviews

Six of the 13 respondents were interviewed at their respective work sites. A summary of the results is here

presented. (The names are fictitious).

Case 1: Jerry is a physics and physical science teacher at a local high school. The most positive aspect of his first year was that he got through what was apparently a difficult year. His number one concern was discipline. He was shocked by the lack of courtesy and control in the classroom. Students would constantly talk, sleep or disrupt. His ninth grade physical science was hardest to handle. Students were hard to motivate: they lacked a desire to learn, a characteristic which plagued even the physics class. He was totally unprepared for these kinds of difficulties, yet does not believe the institute could have prepared him any better for what was in store. He does not believe that "book study" can prepare one for disciplinary problems. He "naively" thought students wanted to learn, but was disappointed by what he considers a rude awakening. In addition to discipline and motivation, another expressed concern was how one goes about dealing with parents.

Case 2: Ray attended the institute in the summer of 1991. He is an eighth grade earth science teacher at a local high school containing grades 8-12. The most positive aspect of his first year was that he survived. His main concern was that he shared a room with another teacher with whom he experienced a personality conflict. Students saw him as a long term substitute using "her room". This led to classroom management concerns which he labeled as his number two problem. Conflicts due to behavior problems and keeping students on task caused him to fear for renewal of his contract for the following year. The institute did not address these kinds of concerns, nor does he think it can. Experience is the best teacher in handling shared rooms and disciplinary problems. He praised the institute for introducing him to a student centered approach and to reflective teaching.

Case 3: Jennifer is presently working with a local science center as an earth science teacher. She works closely with

schools since a continual flow of students visit her facility and her class. She began her teaching career at a local school containing grades eight and nine. She was totally unprepared for the disciplinary problems and the lack of motivation in science. She thought that teaching students how to learn was something she would never have to do. That this was a problem proved very discouraging and in fact she accepted her present position before her first school year had ended. Considering her difficult time, she does not think the institute or anyone could have better prepared her. She believes that personality plays an important role and those persons who cannot cope with these types of concerns will not remain in the profession. She stated that the professors in the institute believed in what they taught and set a positive tone by treating interns as professionals.

Case 4: Ted is an eighth grade earth science teacher at a local junior high. Teaching has been a rewarding, positive experience. His major concern as a first year teacher was the drug and alcohol problem and the lack of motivation. For Ted, the public schools are a separate kind of challenge where students are different than the "kind of child Georgia State (University) is telling us about". Both parents work, consequently no one is home after school to make decisions and assist the child. It is difficult to call parents concerning school matters since they are not at home to accept the call. He believes the institute could have done a better job imparting a better sense of what goes on in the real world. All settings are not necessarily suburban where quiet and subdued children are waiting to learn. He recognizes that it is difficult to prepare interns for the realities of behavioral and motivational concerns. He suggests that a first year teacher be interviewed who is having problems with a "class from hell", who is frustrated with the system and who may share this with the interns. Another expressed concern was the lack of discipline, although this did not appear to be a major consideration for him.

Case 5: Donna holds an advanced degree in biochemistry and teaches biology and chemistry at a local junior college. Her first placement though was at a junior high school containing grades eight and nine where she taught physical science (the same school as Jennifer). Her major concern upon entering public teaching was the discipline and management situations brought about in part by an inconsistent disciplinary system, which led to too much "not teaching". Rather, most of her time was spent overseeing unpleasant situations. Unfortunately, the principal at her school was also in his first year and having a difficult time as well. Donna emphasized that education was not a priority at her school and that the system did not care about the student. She believes the alternative certification institute was designed to prepare persons for general teaching settings and her situation was an exception to this plan. Thus, the institute did what it could, but did not have time to prepare one for every teaching possibility that may present itself.

Case 6: Allison is in her third year at a local high school teaching biology. Her main concern (and surprise) during the first year was the emphasis placed on all sorts of other things besides teaching. Filling out forms, patrolling hallways and guarding rest rooms left her with the feeling that no one cares about teaching. She also expressed concern at the prospect of managing all the duties, paper work, and personalities with which a new teacher is confronted. She views the institute as being very helpful by presenting a positive experience that says you can do it, you can be successful! She recommends that practical exposure to recent institute participants and current teachers is needed to enhance the institute.

Discussion

Results from the tabulation of means from the 13 returned questionnaires reveal that the Fuller and Borich developmental model for concerns has some application here.

Since most of the persons represented by this study were professionals in a different occupation before entering the teaching field, it appears that they may have overcome the typical preservice emphasis on self. Concerns related to self received a mean score of 2.23, task related concerns a 2.41 and impact concerns a 2.96. The higher mean on the impact phase suggests a tendency within the group toward outwardly motivated concerns. That is to say there is a higher emphasis placed on concerns related to the advancement of the well being and development of the child. Participants tended to be concerned about guiding students toward growth and attending to student needs.

While validating the concerns checklist Rogan, Borich and Taylor (1992) examined 969 respondents from two western universities. Of these 478 had recently been admitted to a teacher education program, 300 were near graduating as teachers, 98 were in their first year and 93 had two or more years experience. The 98 first year teachers were labeled novice teachers and had the following mean scores:

Self items	Task items	Impact items
2.24	2.32	2.92

These means are comparable to those obtained in the present study and suggest that this sample of alternatively certified teachers is parallel to a large sample as it relates to concerns.

Given this result, the interviews, conversely, did not generally reflect the same outcome. Of the six interviewed, four proposed discipline concerns as a major constraint. One (Ted) mentioned it and only Allison gave it no thought.

This result may be explained by respondents perceiving discipline concerns as more of an impact concern rather than a self concern since control in the classroom generally relates to impact issues. For example, question 37 relates to the learning done by the student and question 23 to challenging unmotivated students. These goals tend to be more difficult to

accomplish when too much time is spent handling discipline worries. Thus to be concerned about discipline may in fact indicate an impact concern. None of the other self-stage concerns, such as those exhibited by questions 2, 4, 8, 9, 13 and 14 (see figure 1), were considered by those interviewed. These questions more plainly refer to oneself and are not especially student centered. It is interesting to note that in the literature, discipline is the only self-phase concern rated highly. Motivation is commonly listed second (an impact item) and the other items tend to be task-oriented concerns. This too suggests that discipline may not be completely a self interest item.

Rogan, Borich and Taylor (1992) suggest that self concerns may be resolved with experience and job security and therefore decline as time passes. Because interns tend to be mature and established in another field before entering the program, they arrive with more security in job, profession and self esteem. This is an advantage over entry level teachers who pursued the traditional road to a teaching degree and may help explain the intern's focus on impact concerns.

References

Adams, R. D. (1982). Teacher Development: A look at changes in teacher perceptions and behavior across time. Journal of Teacher Education, 33(4), 40-43.

Boccia, J. A. (1989). Beginning teachers speak out: A study of professional concerns in the first three years of teaching. ERIC document ED 316 555.

Borich, G. D. (1988). Effective Teaching Methods. Columbus OH: Merrill Publishing Company.

Borich, G. D. (1992). Effective Teaching Methods (2nd ed.). Columbus OH: Macmillan.

Brickhouse, N., and Bodner, G. M. (1992). The beginning science teacher: Classroom narratives of conviction and constraints. Journal of Research in Teaching, 29(5), 471-485.

Fuller, F. F. (1969). Concerns of Teachers: A developmental conceptualization. American Educational Research Journal, 6, 207-226.

Gomez, M. L., and Comeaux, M. A. (1990). Start with the stone not with the hole. Matching novices' needs with appropriate programs of induction. National Center for Research on Teacher Education, Michigan State University, East Lansing, MI.

Gordon, S. P. (1991). How to help beginning teachers succeed. ERIC document ED 341 166.

King B. B. (1991). Beginning teachers knowledge and attitudes toward history and philosophy of science. Science Education, 75(1), 135-141.

Pigge, F. L., and Marso, Marso, R. N. (1992). The Nature of the difference between 1985 and 1990 first year teacher's reports of job entry reality shock. ERIC document ED 342 743.

Rogan, J. M., Borich, G. D., and Taylor, H. P. (1992). Validation of stages of concern questionnaire. Action in Teacher Education, 14(2), 43-49.

Veenman, S. (1984). Perceived problems of beginning

teachers. Review of Educational Research, 54(2), 143-178.

Veenman, S. (1987). On becoming a teacher: An analysis of initial training. ERIC document ED 312 231.

Figure 1

For each statement below, decide which of the five responses best applies to you now. Place the number of the answer in the box at the left of the statement. Please be as accurate as you can.

[1] Not concerned [2] A little concerned [3] Moderately concerned

[4] Very concerned [5] Totally preoccupied

1. Insufficient clerical help for teachers.
2. Whether the students respect me.
3. Too many extra duties and responsibilities.
4. Doing well when I'm observed.
5. Helping students to value learning.
6. Insufficient time for rest and class preparation.
7. Not enough assistance from specialized teachers.
8. Managing my time efficiently.
9. Losing the respect of my peers.
10. Not enough time for grading and testing.
11. The inflexibility of the curriculum.
12. Too many standards and regulations set for teachers.
13. My ability to prepare adequate lesson plans.
14. Having my inadequacies become known to other teachers.
15. Increasing students' feelings of accomplishment.
16. The rigid instructional routine.
17. Diagnosing student learning problems.
18. What the principal may think if there is too much noise in my classroom.
19. Whether each student is reaching his or her potential.
20. Obtaining a favorable evaluation of my teaching.
21. Having too many students in a class.
22. Recognizing the social and emotional needs of students.
23. Challenging unmotivated students.
24. Losing the respect of my students.
25. Lack of public support for schools.
26. My ability to maintain the appropriate degree of class control.
27. Not having sufficient time to plan.
28. Getting students to behave.
29. Understanding why certain students make slow progress.
30. Having an embarrassing incident occur in my classroom for which I might be judged responsible.
31. Not being able to cope with troublemakers in my classes.
32. That my peers may think I'm not doing an adequate job.
33. My ability to work with disruptive students.
34. Understanding ways in which student health and nutrition problems can affect learning.
35. Appearing competent to parents.
36. Meeting the needs of different kinds of students.
37. Seeking alternative ways to ensure that students learn the subject matter.
38. Understanding the psychological and cultural differences that can affect my students' behavior.
39. Adapting myself to the needs of different students.
40. The large number of administrative interruptions.
41. Guiding students toward intellectual and emotional growth.
42. Working with too many students each day.
43. Whether students can apply what they learn.
44. Teaching effectively when another teacher is present.
45. Understanding what factors motivate students to learn.

Teacher Concerns Checklist by Francis F. Fuller and Gary D. Borich, The University of Texas at Austin, from: Gary D. Borich, *Effective Teaching Methods* (2nd ed.), Merrill/MacMillan. This instrument was revised with the assistance of John Rogan, Western Montana University.

8

The TEEMS Proposal

The TEEMS Project

The Teacher Education Environments in Mathematics & Science Project

A Non-traditional Plan to Prepare Mathematics and
Science Teachers in Georgia

A proposal funded by the Professional Standards Commission State of Georgia, May, 1992

Abstract

This proposal describes a plan to research prior experiences of and to develop the plans for a nontraditional teacher education program in mathematics and science in middle and high school education.

We have been involved with the development of nontraditional teacher education programs over the past six years; two years developing and carrying out the TRIPS program with the Atlanta Public Schools, and four years of involvement with the Georgia Department of Education's Alternative Teacher Preparation Institutes. These prior experiences will provide the experiential framework to go forward to develop a reform program (The TEEMS Project) for the preparation of mathematics and science teachers.

The program will be characterized by:

- reflective and constructivist models of learning
- an holistically organized pedagogical curriculum
- learner-centered instruction in which students will be engaged in a series of experiential and field-based projects
- a partnership with the public schools of Georgia by centering the program in teaching and learning centers (also known as professional development schools)

To study prior experiences with nontraditional teacher education, we will carry out a follow-up study of the graduates of the GSU Alternative Teacher Preparation Institutes (1989 - 1991). A survey questionnaire will be designed to evaluate the effectiveness of GSU's nontraditional program, and provide data on beginning teacher's attitudes, and problems, and the impact of mentoring on the beginning teacher's experience. In addition to the survey data, several intern-mentor pairs will be visited and interviewed to provide qualitative and opinion data. This research will be planned and carried out during the Summer and Fall Quarters of 1992.

To design the nontraditional TEEMS Project, we will assemble a working team of professors from education and arts & sciences to formulate a curriculum accessible at the undergraduate and graduate levels in mathematics and science. The design team will draft a curriculum plan which will include: a rationale, criteria for the selection of teacher education candidates, curriculum and instructional experiences, and evaluation procedures. The design team will begin work during the Fall Quarter, 1992. It is anticipated that the curriculum plan will be prepared by the end of Winter Quarter, 1993; recruitment will occur during the Spring and Summer Quarters, 1993, and the TEEMS Project first group of mathematics and science interns will begin a program of study Fall Quarter, 1993.

We are seeking support for five quarters to conduct research, plan and research the curriculum, advertise the program, recruit students, and launch the TEEMS Project.

Introduction

We propose to radically undertake a reform effort of the preservice preparation of mathematics and science teachers in the State of Georgia. Recent proposals by the National Council on the Teaching of Mathematics (Mathematics Standards), the National Science Teachers Association (The Scope, Sequence and Coordination Project), and the American Association for the Advancement of Science (Project 2061) suggest the need for reform in teacher education. The focus of this reform effort is the impact mathematics and science teachers can have on helping students learn mathematics and science. There is a need to prepare a new cohort of mathematics and science teachers who can respond to the demands of mathematics and science teaching and assume leadership roles in these fields into the 21st century.

We propose to restructure teacher education and build an holistic program that integrates learning and teaching, education and arts and sciences, universities and public schools. The program will be based on a reflective and constructivist model of learning. A constructivist model of teacher education is based on the theory that teachers, like other learners, construct their knowledge of teaching, as well as, of mathematics and science. Thus, the proposed program will involve students in an experiential world of teacher education in which pedagogical knowledge will be constructed in the context of mathematics and science teaching and learning centers (known also as professional development schools).

Studying Prior Experiences . The experiential rationale for this teacher education proposal is based on six years experience with non-traditional teacher education at GSU, as well prior experiences with an experimental science education program known as the Science Education Phase Program at GSU. For the past three years we have been funded by the Georgia Department of Education to support the Alternative Teacher Preparation Institute for secondary mathematics and science teachers. This program was based on reflective inquiry, was organized as an holistic pedagogical curriculum, and involved the intense interaction among interns and mentors in the public schools. Earlier studies (Sisk, 1990, Jensen and Hassard, 1990, and Hassard, 1990, 1992) have reported similarities and differences between teachers prepared in Alternative Certification (AC) programs and Regular Certification (RC) teachers. For example more Alternative Certification teachers (AC) reported they felt more effective in motivating students, were able to deal with individual student differences, and were more likely to say major problems were not noted in planning lessons, class management or student behavior. What do these teachers say after two or three years of teaching? What in their preparation program do they report as being useful in their roles as mathematics and science teachers? How do they view the role of their mentors in helping them learn to become teachers? How effective were the seminars among interns and mentors during their first year of teaching?

One of the first tasks proposed is to evaluate the impact of the Alternative Teacher Preparation Program curriculum on the interns who completed the program, and who are now employed as teachers in Georgia. Of the 68 interns who entered and completed the program, 54 are currently teaching. We will plan a study to answer some of the questions posed above, and create a design that gives the design team further insights into the proposed teacher education program.

Overview of the TEEMS Project. Based on prior experiences with nontraditional teacher education, and coupled with the epistemology of constructivism, we propose to build a mathematics and science teacher education program based on a set of unifying principles, and organized as an holistic curriculum in a sequence of experiential phases in school based environments.

Unifying Principles: Constructivist Learning

The underlying framework The TEEMS Project is constructivism, an emerging epistemology that suggests that human beings construct knowledge through acting on their environment and interacting with other humans. These ideas are based on the work of Piaget (1973, Vygotsky (1989) , von Glassersfeld (1992), and others. In February, the College of Education at the University of Georgia sponsored a four-day conference on constructivism and implications for mathematics and science teacher education. The leading thinkers in world on constructivism were present. As a consequence of this conference, Dr. Jack Hassard (science education, GSU), and Dr. Darwin Smith (chemistry, UGA) coordinated an ongoing dialog among mathematics and science specialists in Georgia. To date we have met four times (approximately 15 - 20 persons per session), and plan to continue the dialog. In addition to UGA and GSU, representatives from the Georgia Department of Education, Georgia Southern University, Georgia Institute of Technology, and North Georgia College have participated in the dialog. These meetings are creating a network of mathematics and science educators interested in applying the concept of constructivism to mathematics and science teacher education. The TEEMS Project "preliminary" proposal has been presented to this group, and undergone review and criticism. The significance of these meetings is long range. It is important to create a network of interested leaders in mathematics and science who are committed to change in the preparation of teachers. We feel that the groundwork has been laid for such a network, and continuing dialog.

Constructivism implies a number of things about teacher education. For one, it must be experientially based, and learners must be exposed to environments of learning in which they explore mathematics and science teaching, and in so doing, construct meaning and knowledge about the field. Teaching strategies should emerge from not only theory, but from demonstration and practice. In a constructivist model of teacher education, students would learn about classroom management, cooperative learning, lesson planning, how kids learn physics in the context of schools, students and teachers. The environment must be interactive, reflective and based on inquiry. There certainly is more to say about constructivism, but one of the tasks for the staff of this proposal is to explore the implications of constructivism for a teacher education curriculum.

School-Based Sequenced Phases

We are proposing that the pedagogical dimension of TEEMS consist of an holistic curriculum organized into a three quarter series of experientially-based phases of learning. Each phase would operate fundamentally in a Mathematics and Science Teaching and Learning Center, and would provide the experiential context for students to learn about teaching and learning mathematics and science.

During the first year, student cadre teams will explore mathematics and science teaching by means of a holistic curriculum built upon the foundation of constructivist principles, and current notions of pedagogical knowledge. The curriculum will consist of three sequenced phases (see Figure 1) in which students will work with professors, practicing teachers and learners in elementary, middle and high school-based settings. Constructivist learning, reflective thinking and teaching, and inquiry learning will characterize the work of interns, professors and teachers in professional development sites which we refer to as Mathematics and Science Teaching and Learning Centers

(MSTL Centers)[1]. The curriculum will be project and problem solving based. Students will learn strategies and methods to help students learn in the context of real classrooms, real students, and real teachers.

Intern-Mentor Teaching Experience

During the second year, students will teach full-time as paid professionals in a public school under the supervision of mentor teachers. Students holding bachelors degrees in mathematics or science will follow a planned masters degree in mathematics or science teaching (middle school and secondary). These students will also be involved in courses and experiences in mathematics and science during this time to complete the requirements of the master's degree. The program will also incorporate undergraduates at Georgia State University working on bachelors degrees in education or arts and sciences, and undergraduate science and engineering majors from Georgia Tech. These students would have completed the requirements for their respective degrees in year 1, and during year 2 will teach under the supervision of a mentor.

In addition to the concept of Mathematics and Science Teaching and Learning Centers, we also will establish a network of Partner Schools. Partner schools[2] will provide positive environments for first year teachers and work with us in the identification and staff development of mentor teachers. Students who have completed the first year of the program will then teach full-time in one of the Partner Schools.

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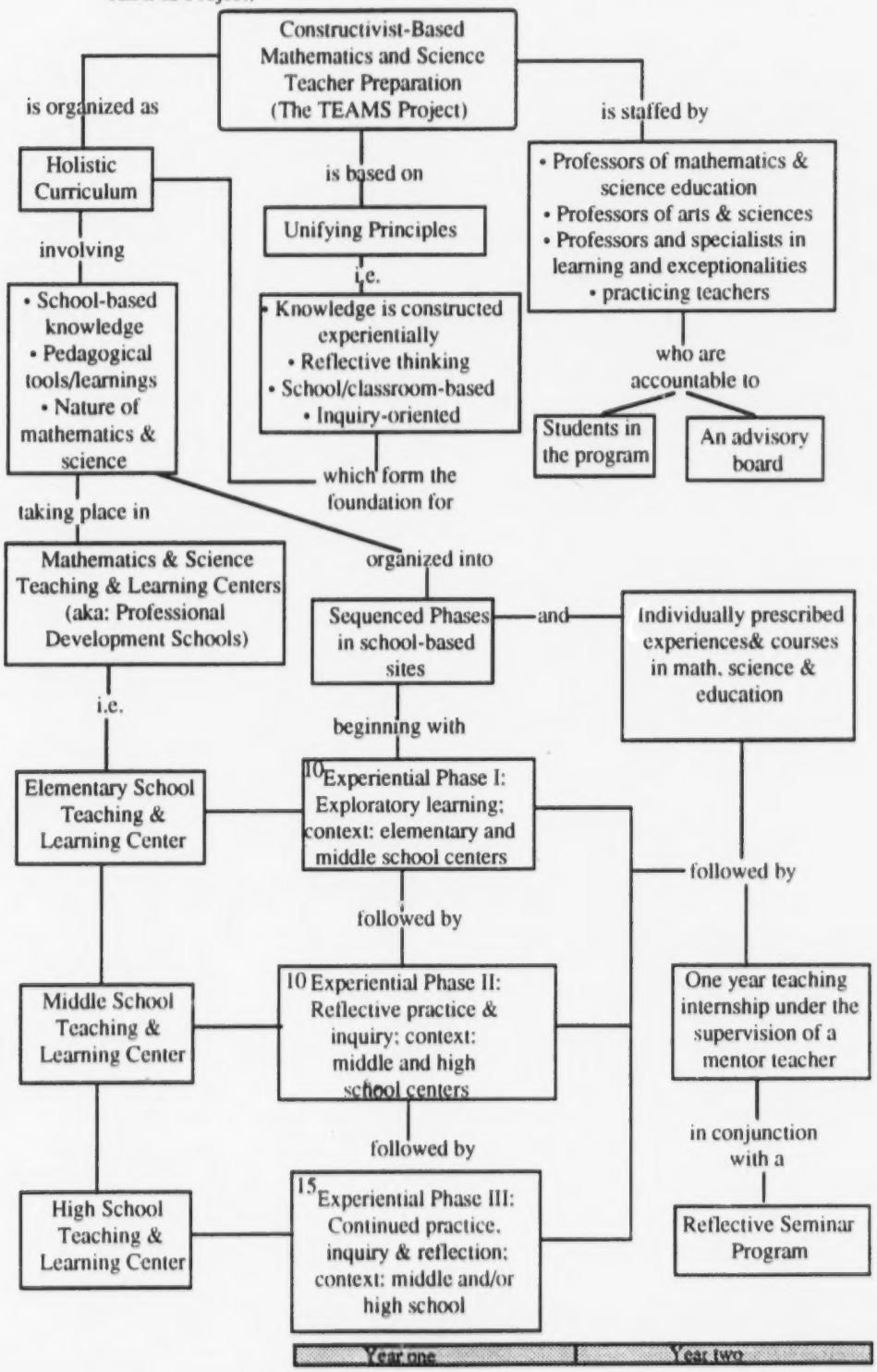
[1]Mathematics and Science Teaching and Learning Centers will be based on the notion of Professional Development Schools. In the teaching and learning centers, interns will work under the supervision of professors in mathematics and science classrooms, K-12. As shown in Figure 1, interns will be involved in elementary, middle and high school centers.

[2]Partner schools are an outgrowth of the experience we have had with the Alternative Teacher Preparation Institutes. An important feature of the Alternaitve Institute was the continued contact with interns and their mentors through a series of seminars at GSU. However, the contact with principals, lead teachers, and mentor in the schools who hired AC interns was noted as important to all the parties.

Figure 1. Concept Map: Teacher Education and Mathematics & Science (The TEAMS Project)


Constructivist-Based Mathematics and Science Teacher Preparation (The TEAMS Project)
is organized as
is based on
is staffed by
Holistic Curriculum
Unifying Principles
• Professors of mathematics & science education
• Professors of arts & sciences
• Professors and specialists in learning and exceptionalities
• practicing teachers
involving
i.e.
• School-based knowledge
• Pedagogical tools/learnings
• Nature of mathematics & science
• Knowledge is constructed experientially
• Reflective thinking
• School/classroom-based
• Inquiry-oriented
who are accountable to
Students in the program
An advisory board
which form the foundation for
taking place in
organized into
Mathematics & Science Teaching & Learning Centers (aka: Professional Development Schools)
Sequenced Phases in school-based sites
and
Individually prescribed experiences& courses in math, science & education
i.e.
beginning with
Elementary School Teaching & Learning Center
10 Experiential Phase I: Exploratory learning; context: elementary and middle school centers
followed by
followed by
Middle School Teaching & Learning Center
10 Experiential Phase II: Reflective practice & inquiry; context: middle and high school centers
One year teaching internship under the supervision of a mentor teacher
in conjunction with a
followed by
High School Teaching & Learning Center
15 Experiential Phase III: Continued practice, inquiry & reflection; context: middle and/or high school
Reflective Seminar Program
Year one
Year two

Goals and Objectives of The TEEMS Project

A. Investigate the effectiveness of the Alternative Teacher Preparation Institutes held at Georgia State University, and use this information, and current literature and research on nontraditional as a foundation for the reform of teacher education in mathematics and science at Georgia State University.

B. Design and carry out the TEEMS Project which will entail the following subgoals:

1. Attract and select teacher candidates motivated and with the potential to become exemplary mathematics and science teachers in the middle and high schools of Georgia. Candidates will be recruited from Georgia State University, Georgia Tech, as well as from individuals who are recent graduates in mathematics and science from other colleges and universities, and from among individuals contemplating a career change.

2. Design and implement a mathematics and science teacher education program which prepares teachers who possess a range of knowledge, abilities and skills including:

- a thorough grasp of the knowledge base under girding teaching practice based on constructivism, a repertoire of instructional strategies, and skills to apply these to the mathematics and science education of students in middle and high schools

- an understanding and the ability to use methods of inquiry and research findings in making professional decisions

- ability to transcend their own personal experiences in the classroom as students, and subsequently as teachers, in order to make instructional decisions based on professional knowledge

- a thorough grasp of a philosophy of teaching that is based on reflective thinking, inquiry learning and experiential learning, and the ability to apply this to classroom practice

- a comprehensive understanding of methods of student assessment and measurement including observations, performance testing, portfolio assessment and standardized examinations, and the ability to interpret and use the results

- appreciate their ethical and moral responsibilities in a system of compulsory education

3. Evaluate and study the effectiveness of this teacher education program by conducting formative, summative, and longitudinal research investigations.

4. Interface with other reform efforts and projects and organizations in Georgia such as the Georgia Partnership for Excellence in Education, the Statewide Systemic Initiative in Mathematics and Science (GIMS), the Global Thinking Project, the Georgia Science Teachers Association, and Georgia Council on Mathematics

Concepts and Definitions

Constructivism. An epistemology that believes that learners actively construct knowledge rather than passively take in information.

Holistic curriculum. Learning experiences integrating knowledge about learners, schools, pedagogy and the nature of mathematics and science.

Mathematics and Science Teaching & Learning Centers. School settings that have been designated and prepared to be professional development sites for prospective teachers. These centers also reflect innovative teaching practices such as schools for the future, magnet centers of mathematics, science & technology, as well as other restructuring efforts. Faculty in these schools are conceived as partners with professors in the development and implementation of the sequenced phases of the program.

Sequenced Phases. A series of pedagogical experiences in which interns construct knowledge about and reflect on teaching in the context of real schools. Sequenced phases represent the environment in which a holistic curriculum is developed.

Internship. A one-year experience of full-time teaching in a Partner Middle or High school under the direction of a mentor teacher. Internships follow the sequenced phase part of the program. Some students (masters degree candidates) will be interning as provisionally certified teachers, whereas others will be interning with T-4 licenses. The internship program will follow the plan used in the Georgia State University Alternative Teacher Education Program. Interns and mentors will meet in a series of monthly seminars.

Mentors. Licensed teachers of mathematics or science who have been prepared to work as mentors with beginning teachers. Mentors reside in the same school as their interns, and are responsible for working with the interns during the first year of teaching.

Partner Schools. These are schools that have entered into a partnership with the project agreeing to hire students from the program either as fully or provisionally licensed by the Professional Standards Commission. Administrators in these schools and districts will facilitate the identification and preparation of mentor teachers in mathematics and science. A mentor teacher will be assigned to each of the interns who will coach and supervise the intern's first year of teaching.

Components of the Project

1. Recruitment, selection and counseling of students. The program has been designed to attract candidates from several recruitment pools including:

- post baccalaureate students holding degrees in mathematics, science, or engineering who are recent graduates, or are mid career changers
- undergraduate arts and sciences students at Georgia State interested in teaching mathematics or science.
- undergraduate middle childhood education majors who are interested in concentrating in mathematics and science
- undergraduate students at Georgia Institute of Technology who are interested in teaching, and who are willing to incorporate the 35 hours of the sequenced phases into their curriculum

2. A two-year curriculum integrating school experiences, pedagogy and the construction of mathematical and science knowledge organized in the following fashion:

- A one year sequenced phase program in which mathematics and science teacher candidates learn about, and practice the art of mathematics and science teaching.

- A one year supervised internship under the joint leadership of mentor teachers and university faculty.

3. Mathematics and Science Teaching and Learning Centers located in schools in close proximity to Georgia State University in which school faculty from these centers will work with professors in education and arts and sciences to plan and implement a sequence of mathematics and science phases. We will establish three types of Centers: one each at the following levels:

- elementary school
- middle school
- high school

4. A network of Partner Schools that will be involved in the recruitment and hiring aspect of the program in which students will complete a planned internship jointly under the supervision of mentor teachers and university education and arts and science faculty.

4. Research and Evaluation. We plan to conduct a number of research and evaluation studies that will enable us to explore topics such as:

- determine the effectiveness of this model on the preparation of middle and high school mathematics and science teachers

- long term tracking of graduates of this program looking at their retention rates, effectiveness in teaching, and classroom performance

- the impact of the program at the university level in terms of changes in education and arts and sciences experiences for students

Tasks

1.0 Evaluation and Research

1.1. Conduct a research study examining the impact of the Georgia State University Alternative Teacher Preparation Program which was implemented during the period 1989 - 1992. Complete a report identifying the major outcomes and recommendations, and the implications for the new program. (Year 1)

1.2. Design a research and evaluation program for the project, including quantitative and qualitative approaches. The design will include formative, summative, and long term procedures. (Year 2)

2.0 Curriculum Planning and Development

2.1. Identify a planning team of education and arts and sciences faculty, and mathematics and science teachers who will be responsible for creating a

constructivist curriculum in a sequenced phased program. The planning team will also make recommendations for the development and/or modification of mathematics and sciences courses that reflect a hands-on, and constructivist approach. (Year 1)

2.2. Identify an advisory board made up of professors, deans, secondary faculty, administrators, and business leaders. The board will meet with the project faculty and staff, review the plans for the project, and continue to meet to review the curriculum and teacher education program as it unfolds. (Year 1)

3.0. Professional Schools

3.1. Identify and work with faculty to establish schools (Mathematics and Science Teaching and Learning Centers) which will provide the school-based sites for the implementation of the holistic mathematics and science curriculum. These schools will demonstrate recent trends in mathematics and science education including but not limited to: focus on problem solving and real world mathematics; restructuring efforts in mathematics and science curriculum; programs focusing on science, technology and society; alternative assessment; multicultural education; research on student learning; cooperative learning. (Year 1 and 2)

3.2. Identify Partner Schools that advocate peer-coaching and mentoring as an integral part of a teacher's development. Partner Schools, for example, might be clustered around Regional Centers for Educational Innovation and Leadership, and be involved in an ongoing mentoring program. Interns would begin their teaching careers in Partner Schools and receive peer-coaching and mentoring on a continuous basis. (Year 2)

4.0 Implementation

4.1. Design and plan an implementation strategy that integrates the components of the program into an holistic scheme. (Year 2)

Project Staff

Project Staff are identified only for Year 1. We will submit another proposal to identify staff for Year 2.

Dr. Jack Hassard, Project Director. Dr. Hassard has directed the Alternative Teacher Preparation Institutes (1989 - 1992) at Georgia State University. He is a professor of science education in the Department of Curriculum and Instruction. He is author of a number of books on science and science education including most recently *Minds On Science: The Art of Teaching Middle and High School Science* (Harper Collins, 1992), *The Whole Cosmos Catalog of Science* (Scott, Foresman, 1991), and *Science Experiences: Cooperative Learning and the Teaching of Science*, 1990). Dr. Hassard will direct the project.

Dr. Hiram Johnston. Dr. Johnston is professor of mathematics education in the Department of Curriculum and Instruction, and has been involved in the Alternative Teacher Education Institutes at GSU since 1989. He is an active force in shaping mathematics education at GSU, and is committed to creating a nontraditional mathematics and science program. He will work with Dr. Hassard and co-lead the design team for the development of the TEEMS Project curriculum.

Other Staff:

Faculty at GSU: Faculty members from the College of Education and the College of Arts & Sciences will be involved in reviewing and making recommendations on the TEEMS Project. Dr. Tom Briske (mathematics) and Dr. Sid Crow (Biology) will be involved in this process as well as other faculty from science and mathematics education, special education, and educational foundations. Dr. Parker Blount, chariperson of Educational Foundations, has been a staff member in the Alternative Teacher Preparation Program at GSU, and will be involved in the creation of an holistic curriculum.

Faculty at Other Universities. We will also consult with Dr. Darwin Smith, Department of Chemistry at UGA, Dr. Carolyn Thorsten, Director , and Dr. Lynn Fountain, Assistant to the Director of the Center for Education in Science and Mathematics at Georgia Tech.

Doctoral Student(s). Jo Ann Rawlings and David Geisel, doctoral students in Curriculum and Instruction will work with Drs. Hassard and Johnston to design the research study on the Alternative Institute, and to plan research studies on the TEEMS Project.

Student Assistant. Cathy Warfield, a middle school science teacher, who served as Dr. Hassard's assistant for each of the Alternative Institutes, has agreed to continue working with the project.

Research Assistant. Marjorie D'Olivo, who was a mentor in the Alternative Institute, and an instructor in the 1990 and 1991 Institute will work with Dr. Hassard on the research program.

References

Fox, M. C., A Study of Educational Attitudes of Alternatively Certified and Traditionally Certified Beginning Teachers, Unpublished Doctoral Dissertation, Georgia State University, 1989.

Hassard, Jack, "Alternative Certification of Secondary Foreign Language, Mathematics, and Science Teachers", paper presented at The American Association of Colleges for Teacher Education Annual Meeting, Chicago, February 24, 1990.

Hassard, Jack, *Minds On Science: The Art of Teaching Middle and High School Science*, New York: HarperCollins Publishers, 1992.

Hassard, J. & Jensen, R. An Alternative Secondary Teacher Training Model: The Georgia Model, ERIC Clearinghouse on Teacher Education, Document SP030924, 1989.

Piaget, J., To Understand is to Invent, New York: Viking, 1973.

Sisk, K. A. A Study of Beginning Teachers' Sense of Efficacy, Unpublished Doctoral Dissertation, Georgia State University, 1989.

von Glassersfeld, Ernst, "A Constructivist Approach to Teaching," paper presented at the Conference on Epistemology, University of Georgia, February, 1992.

Yaroshevsky, Mikhail, *Lev Vygotsky*, Moscow: Progress Publishers, 1989.

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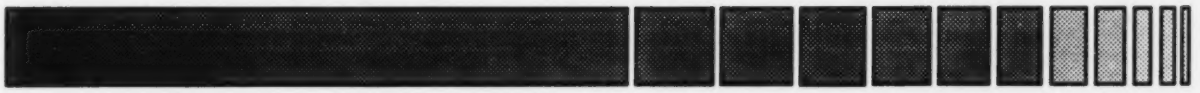
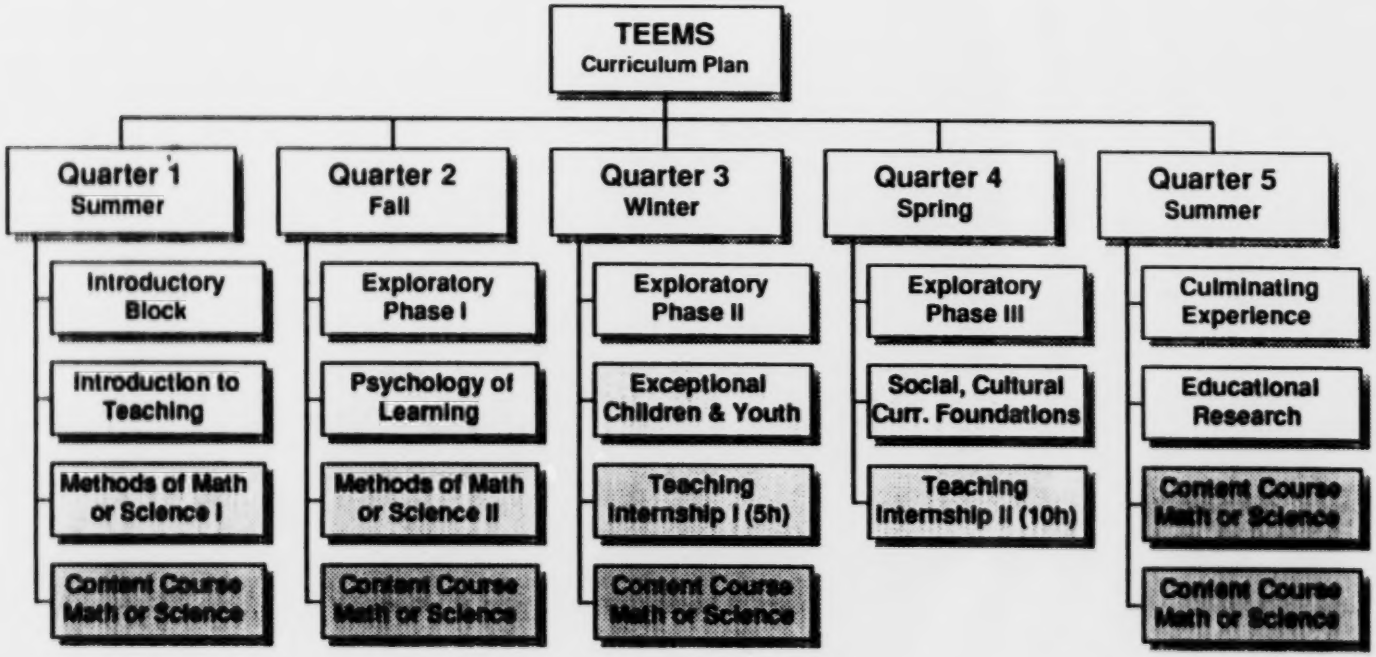


The TEEMS Curriculum

Teacher Education Environments for Mathematics and Science (TEEMS)



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PROPOSAL FOR CHANGE IN PROGRAM STRUCTURE
Master of Education
Major: Mathematics or Science Education
TEEMS Alternative Preparation Program

1. Catalog copy: see attachment for intended copy.

2. Effective date and duration: Summer Quarter, 1994

3. Design: The proposed program will provide initial teacher preparation for students holding at least a bachelors degree in engineering, mathematics, science. The program below is a graduate-level teacher preparation program which combine the opportunity for advanced study in a discipline (mathematics or science) with a series of extended field and clinical experiences linked to subject matter pedagogy and related professional studies.

4. Rationale: The proposed program will meet new standards for the preparation of mathematics and science teachers based on publications by the National Council of Teachers of Mathematics and the National Science Teachers Association. In this regard, the proposed program will be organized around an holistic curriculum that assumes a common vision and program themes including constructivism, reflective thinking and inquiry learning. A team of professors will plan, teach and evaluate a cadre of students on a five-quarter cycle of learning experiences.

5. Consistency with the Mission of the College: The proposed program is consistent with the College of Education's desire to provide nontraditional and innovative programs to prepare teachers for the 21st Century.

6. Consistency with relevant professional standards: The proposed TEEMS program is based on Guidelines for the Post-Baccalaureate Education of Teachers of Mathematics (National Council of Teachers of Mathematics, 1989), and the NSTA Standards for Science Teacher Preparation (National Science Teachers Association, 1993).

7. Relationship with other programs: This program will provide an option for post-baccalaureate students who are seeking initial teacher preparation in mathematics or science.

8. Enrollment effect: The program will draw students from the current post-baccalaureate program, and will also attract the type of students who were participants in the Alternative Teacher Preparation Institute in Mathematics and Science.

9. Effect on resources: The design of the program impacts a number of resource areas including faculty collaboration, allocation of space, purchase of technology, and co-operation with mentors from the public school. These items should be considered when the budget and allocation of resources are made by the Department. A great deal of collaboration has gone into the development of this proposal. We have met with representatives from the Departments of Educational Foundations, and Special Education, as well as the Mathematics and Computer Sciences Department, Biology, Chemistry and Physics Departements in Arts and Sciences. We anticipate further collaboration for planning, as well as for team-teaching throught the duration of this program.

Master of Education (M.Ed.) Program
Major: Mathematics or Science Education
TEEMS Alternative Preparation Program

Teacher Education Program

The Teacher Education Environments for Mathematics and Science (TEEMS) is a graduate-level initial teacher preparation program for students holding degrees in engineering, mathematics or science.

The criteria for admission to the TEEMS program include:

- holding an undergraduate degree in engineering, mathematics or science from a regionally accredited college or university.
- undergraduate grade-point average of 2.5.
- present a minimum score of
  (a) 800 on the General Test (Verbal and Quantitative subtests only) of the Graduate Record Examination taken within the last five years, OR
  (b) 44 on the Miller Analogies Test taken within the last five years.
- three recommendations including: one academic or professional letter; one letter from someone who can evaluate the applicant's personal qualifications, experience, and background in light of potential to work successfully with adolescents; if applicable, one recommendation from current supervisor.
- documentation of previous work experience.
- interviews conducted by faculty and school-based personnel.
- other requirements that may be specified by the Department of Middle and Secondary Education and Instructional Technology.

Except for four of the mathematics and science courses, this program is a fixed sequence starting in the summer quarter each year and running through the following summer quarter. Admission to the TEEMS program is once a year and applicants must meet a January 15 deadline for applications and supporting materials (contact department for materials required). The program begins in summer. Individuals completing this program as described may be recommended for Georgia Educator Certificate in the field of secondary Mathematics (7-12) OR Science(7-12).

Note: Due to the special nature of this program, students who drop out will not be able to complete it unless they re-apply to enter the next cycle. The program is offered only once a year.

Program of Study

A. Professional Studies (20 quarter hours)

FED 708	The Psychology of the Learner and Learners (5)
FED 712	Social and Cultural Foundations of Education (5)
FED 790	Methods of Research in Education (5)
EXC 601	Exceptional Children and Youth (5)

B. Teaching Field (40 quarter hours)

Pedagogical Content

MSIT 660 Introduction to Secondary Teaching (5)

AND

EDMT 656 Methods and Materials for Teaching Mathematics (5)
EDMT 756 Teaching Mathematics in Secondary Education (5)

OR

EDSC 655 Methods and Materials for Teaching Science (5)
EDSC 755 Teaching Science in Secondary Education (5)

Mathematics or Science Content

Mathematics Majors
Math 601 College Geometry (5)

Select 20 hours of mathematics with consent of advisor

Science Majors
Physics 701 Foundations of Physical Science (5)

Select 20 science from biology, chemistry, earth science, or physics with consent of advisor

C. Internship (15 quarter hours)

MSIT 866	Practicum I (5)
MSIT 867	Practicum II (5)
MSIT 868	Practicum III (5)

Total: minimum of 75 quarter hours.

Exit Requirements

- 3.0 grade-point average
- successful completion of the Teacher Certification Test in Secondary Mathematics or Science.
- successful completion of practicums with a grade of "B" or better.

TEEMS Program
Proposed Holistic Schedule

Quarter/Courses	Student Outcome Statements	Context/Purpose of Field-based Experiences	Primary Focus
Summer I • MSIT 660 • EDMT 656 or • EDSC 655 • Math 601 or • Physics 701	• Students will be examine their current beliefs and concepts of teaching • Students will integrate the content of mathematics and science with pedagogy • Students will explore mathematics and science teaching in a laboratory setting	University based-microteaching and reflective teaching sessions Students will begin to learn about teaching by participating in reflective teaching and microteaching sessions.	• Introduction to and reconnaissance of the profession of teaching • Introduction to the constructivist model of learning • Introduction to reflective approach to teacher preparation and enhancement
Fall • FED 708 • EDMT 756 or • EDSC 755 • Mathematics or Science Course	• Students will investigate how students learn mathematics and science. • Students will plan, carry out, and evaluate math and science lessons presented to small groups of students. • Students will explore teaching with diverse groups of students.	Upper elementary and/or middle school Students will observe teaching, and present lessons to groups of students in an elementary and/or middle school setting.	How do students learn? What are the foundations of education and how do they impact the learning of mathematics and science.
Winter • MSIT 866 • EXC 601 • Mathematics or Science Course	• Students will analyze teaching from a constructivist point of view. • Students will explore how students learn with special emphasis on student exceptionalities. • Students will learn to integrate technology into classroom teaching.	Middle school and/or high school Apprenticing in a middle school which will include assisting as well as some teaching responsibilities.	How do students with different exceptionalities learn? What is the role of a mathematics or science teacher?

Spring • MSIT 867 • MSIT 868 • FED 712	• Students will examine the social, cultural and curriculum issues of the school. • Students will plan, teach and evaluate mathematics and science lessons.	Middle or high school Full-time apprenticeship in a middle or high school.	Social, cultural and curriculum issues related to mathematics and science teaching
Summer II • FED 790 • (2) Mathematics or Science Course	• Students will explore ways of evaluating the effectiveness of their teaching. • Students will examine research finds from the literature of mathematics and science education and apply to their own views of teaching	University-based	Culminating experience focusing on evaluation

TEEMS Alternative Preparation Program
Attainment of Program Outcomes

Outcomes	How or Where Attained
Professional Education	
I. The program shall require experiences to develop knowledge, skills, and attitudes in the prospective teacher which will enhance pupil self-esteem and confidence and promote constructive interaction among people of differing economic, social, racial, ethnic, and religious backgrounds.	FED 712, MSIT 660
II. The program shall require study of general principles of life-long human growth and development and the relationship of teaching and learning theories to physical, social, intellectual, and emotional development.	FED 708
III. The program shall require study of the research about teacher characteristics and behaviors as they affect the learner.	FED 790, MSIT 660
IV. The program shall require study of the communication processes and skills for use between the teacher and pupil and between the teacher and others.	MSIT 660
V. The program shall require study of techniques for diagnosing the capabilities of the learner and for designing instructional programs for all pupils in the least restrictive environment.	FED 708, MSIT 660, EDMT 656, EDSC 655
VI. The program shall require clinical and field-based experiences designed to prepare students to work effectively in specific education roles and to relate the professional program to the world of practice. The nature of these experiences shall be documented.	FED 708, EDMT 756, EDSC 755, MSIT 866-878
I. Clinical and field-based experiences (student teaching, practicum, internships) shall be accompanied by professional supervision and feedback that includes attention to instructional plans, characteristics of learners and instructional settings, structured observation of the experiences and detailed debriefings relative to program goals. II. Pre-student teaching field experiences shall be a portion of the coordinated professional development of the prospective teacher. III. The student teaching experience shall be direct, substantial, and full-day for at least ten weeks. Experiences shall be supervised by those qualified to relate them to the professional studies component.	FED 708, EDMT 756, EDSC 755, MSIT 866-878
VII. The program shall incorporate study of multicultural and global perspectives.	FED 708, FED 712, EDMT 656, EDSC 655
VIII. The program shall require study of skills and strategies to be used in classroom management of individual, small, and large groups under varying conditions.	MSIT 660, EDMT 656, EDMT 756, EDSC 655, EDSC 755

IX. The program shall require prospective teachers to observe and analyze a variety of teaching models and to assess their own teaching effectiveness and professional growth needs.	MSIT 866
X. The program shall require study of the leaders, ideas, and movements underlying the development and organization of education in the United States	FED 712, EDMT 756, EDSC 755
505-3-.28 Mathematics Education Program (1) PURPOSE. This rule is to state criteria for approving programs that prepare individuals to teach mathematics in grades 7-12 and to supplement requirements in Rule 505-3-.01, Procedures and Requirements for Approving Professional Education Units and Programs Preparing Education Personnel. (2) REQUIREMENTS. (a) To receive approval, an institution shall offer a basic preparation program as described in program planning forms, catalogs, and syllabi addressing the following standards.	Undergraduate degree in mathematics
1. Standard I. The program shall require demonstrated competence in understanding the basic concepts of algebra; elementary and trigonometric functions; Euclidean and non-Euclidean geometry; analytic geometry and calculus; probability and statistics; and modern linear and abstract algebra.	Undergraduate degree in mathematics
2. Standard II. The program shall require demonstrated competence in understanding of standard mathematics vocabulary and symbols and the logical principles used in mathematics proofs.	Undergraduate degree in mathematics
3. Standard III. The program shall require demonstrated competence in understanding number concepts and computational algorithms, including estimation and approximation, and in using appropriate models and manipulatives.	Undergraduate degree in mathematics
4. Standard IV. The program shall require demonstrated competence in understanding the intellectual, historical, and philosophical nature of mathematics, methods of applying mathematical principles to other disciplines, and the relationship of mathematics to social conditions through technology.	EDMT 656, EDMT 756

5. Standard V. The program shall require demonstrated competence in the selection and creation of appropriate mathematical models to solve applied problems.	EDMT 656, EDMT 756
6. Standard VI. The program shall require demonstrated competence in identifying, developing, and solving problems involving the application of mathematical concepts, principles, and problem-solving strategies.	EDMT 656, EDMT 756
7. Standard VII. The program shall require demonstrated competence in using calculators and computers in mathematical applications and problem solving.	EDMT 656, EDMT 756
8. Standard VIII. The program shall require demonstrated competence in using an appropriate computer language to write programs.	Undergraduate degree in mathematics, EDMT 656, EDMT 756
505-3-.35 Science Education Program (1) PURPOSE. This rule is to state criteria for approving programs that prepare individuals to teach broad field science and/or the science specialties of biology, chemistry, earth/space science and physics in grades 7-12 and to supplement requirements in Rule 505-3-.01, Procedures and Requirements for Approving Professional Education Units and Programs Preparing Educational Personal. (2). Requirements	
(a) Programs may be offered in broad field science and/or the specific science fields of biology, chemistry, earth/space science and physics.	Undergraduate degree in science
(b) BROAD FIELD. The program shall require demonstrated competence equal to a primary concentration in at least one of the disciplines listed and secondary concentration in at least three other science specialties listed in this rule.	Undergraduate degree in science, and/or graduate level science courses in Masters Degree Program
(c). SPECIALTY FIELDS. The program shall require demonstrated competence and in-depth knowledge equal to a major or the equivalent in one of the science specialty areas listed.	Undergraduate degree in science as a prerequisite to admission to the Masters degree
(d) To receive approval, an institution shall offer a basic preparation program as described in program planning forms, catalogs, and syllabi addressing the following standards.	
1. General Standards Applicable to All Science Fields	

(i) Standard I. The program shall require demonstrated competence in the knowledge of and experience investigating scientific phenomena, interpreting the findings, and communicating them to others	Undergraduate degree in science
(ii) Standard II. The program shall require demonstrated competence in the knowledge of the history and philosophy of science and the interrelationships among the sciences.	EDSC 655, EDSC 755, Arts and Sciences courses
(iii) Standard III. The program shall require demonstrated competence in the knowledge of the ethical, human, technological, and environmental implications of the various disciplines of science.	EDSC 655, EDSC 755
(iv) Standard IV. The program shall require demonstrated competence in the knowledge of and experience in the application of mathematical concepts, statistical concepts, and the use of computers in scientific investigation.	Undergraduate degree in science
(v) Standard V. The program shall require demonstrated competence in conducting laboratory demonstrations and field activities.	EDSC 655, EDSC 755, MSIT 866, 867, 868
(vi) Standard VI. The program shall require demonstrated competence in the knowledge of health and safety procedures, proper disposal of waste materials, and proper care of instruments and laboratory equipment.	EDSC 655, EDSC 755 MSIT 866, 867, 868
2. SPECIALTY AREAS	
(i) Biology.	
(I) Standard I. The program shall require demonstrated competence in the knowledge of and experience in conducting laboratory demonstrations and field experiences using a diversity of living materials and identifying and describing biological phenomena as they appear in the world of living organisms.	Undergraduate degree in science; graduate biology courses
(II) Standard II. The program shall require demonstrated competence in the knowledge of chemistry and environmental science.	Undergraduate degree in science, graduate science courses
(III) Standard III. The program shall require demonstrated competence in the knowledge of the ethical, human, technological, and environmental implications of biology.	EDSC 655, EDSC 755, Undergraduate degree in science
(ii) Chemistry	
(I) Standard I. The program shall require demonstrated competence in the knowledge of fundamental principles of chemistry.	Undergraduate degree in science, graduate chemistry courses
(II) Standard II. The program shall require demonstrated competence in the knowledge of organic, inorganic, and analytical chemistry, physical chemistry, and biochemistry.	Undergraduate degree in science, graduate chemistry courses

(III) Standard III. The program shall require demonstrated competence in the knowledge of the ethical, human, technological, and environmental implications of chemistry.	EDSC 655, EDSC 755, Undergraduate degree in science
(iii) Earth/Space Science	
(I) Standard I The program shall require demonstrated competence in the knowledge of the interdisciplinary nature of earth/space science and its relationship to the natural environment.	Undergraduate degree in science, graduate earth science courses
(II) Standard II. The program shall require demonstrated competence in the knowledge of the biological and physical sciences beyond the introductory level.	Undergraduate degree in science, graduate science courses
(III) Standard III. The program shall require demonstrated competence in the knowledge of astronomy, geology, meteorology, and oceanography, with specialization in at least two of these areas.	Undergraduate degree in science, graduate science courses
(IV) Standard IV. The program shall require demonstrated competence in the knowledge of the ethical, human, technological, and environmental implications of earth/space science.	EDSC 655, EDSC 755, Undergraduate degree in science
(iv) Physics	
(I) Standard I The program shall require demonstrated competence in the knowledge of physics beyond the introductory level and the application of physics to the various fields of science and technology.	Undergraduate degree in science, graduate physics courses
(II) Standard II. The program shall require demonstrated competence in the knowledge of two of the following: chemistry, another field of natural science, or mathematics.	Undergraduate degree in science, graduate science courses
(III) Standard III. The program shall require demonstrated competence in the knowledge of the ethical, human, technological, and environmental implications of physics.	EDSC 655, EDSC 755, Undergraduate degree in science

Syllabus(New)
MSIT 660
Introduction to Secondary Teaching

Catalog Description

MSIT 660 Introduction to Secondary Teaching (5)

Examines instructional materials, teaching strategies, and evaluation procedures for teaching in secondary schools. Includes experiences in reflective teaching and micro-teaching.

Co-requisites: Concurrent enrollment in EDMT 656, EDLA 657, EDSC 657, or EDSS 658.

Textbooks: Arends, Richard I. (1991). *Learning to Teach*. New York: McGraw-Hill.
Henderson, James G. (1992). *Reflective Teaching: Becoming an Inquiring Educator*. New York: Macmillan.

Course Objectives:

-To examine personal beliefs relating to education and to teaching.
-To examine the historical, social, and political influences that impact on secondary schools.
-To analyze current issues in education, specifically, diversity, technology, and effective teaching practices.
-To plan, teach, and participate in lessons in reflective teaching and micro-teaching.
-To examine the relationship between good planning, , successful learning experiences, and assessment.
-To begin to develop a repertoire of basic teaching models, strategies, and skills.
-To develop an understanding of the dynamics of teaching, both inside and outside the classroom.
-To begin developing an awareness and appreciation of the research base that supports current practices of teaching.
-To begin to develop skills with which to observe, record, and analyze teaching roles and behavior.
-To explore classroom management strategies used by teachers in middle and secondary classrooms.
-To analyze the effect of the context of teaching on the teaching process.
-To identify, locate and evaluate resources for effective teaching.

Requirements:

Class Participation and Attendance

It is expected that students will attend class regularly. Points will not be awarded for attendance or class participation. However, your ability to achieve the course objectives will be greatly effected if you are absence from class and will effect the quality of your participation in the discussions. activities, opportunities for reflection, and the timeliness of class assignments.

Examinations

A midterm and final exam will be given as scheduled. Students are expected to take the exams on the assigned dates. Any exceptions must be approved, in advanced, by the instructor.
(50 pts. each)

Projects/Activities:

Reflective Teaching Sessions

Students will be introduced to teaching by participating in a series of reflective teaching sessions. Each student will participate as a designated teacher as well as a learner in other students' lessons. Designated teachers will be given instructional objectives, and asked to plan and teach a short lesson to a group of five peers. The designated teachers will teach the lesson, conduct a brief reflective teaching discussion with their group of learners, and then report the results to the whole class. The concept of reflective teaching is based on work of Cruickshank, et.al., at Ohio State University.

Reflective Teaching Critiques: Students will write a critique of their personal experience in the reflective teaching sessions. The critiques should address the following questions:

-What did you learn about your teaching strengths through the reflective teaching experience?
-What teaching behaviors did you find most effective for you during your teaching episode? How do these behaviors compare to the characteristics of successful teachers as identified in the effective teacher research?
-Did you observe effective teacher behaviors when other designated teachers presented their lesson? What were they?
-Did a model of teaching emerge as a result of your experience in reflective teaching? If so, describe and illustrate your model of teaching.

(20 points)

Holistic-Reflective Personal Log

Students will keep a "holistic-reflective personal log" in which they will make daily entries synthesizing what they learned about teaching as a result of their experiences in the Summer program. (Note: the log should describe your work lot only in this course, but in the other courses you are taking in this introductory quarter. Log entries should 1) be brief: limit each day's entry to no more than two facing pages in your log; 2) include left brain (verbal) and right brain (diagrams, pictures, drawings) entries to reflect your thinking; 3) be made for each day of the course; 4) be kept in a separate book. The log will be a way for you to integrate pedagogy, content-pedagogy, and content and will reinforce the goal of becoming an reflective, inquiry-oriented teacher.
(20 points)

Micro-Teaching Sessions

Students will participate in a series of micro-teaching sessions in which they will present short, content-oriented lessons to small groups of peers. The lesson will be video-taped, and used for feedback and analysis. The micro-teaching sessions will be integrated with activities taking place in the subject matter methods courses, and the content course in which students are concurrently enrolled.
(20 points)

Mini-Teaching Module

Students will design and field tested in a micro-teaching session a secondary teaching module consisting of three lessons, plus pre and post testing activities. The lessons should reflect an active and experiential philosophy of teaching, and should reflect the students initial knowledge of various models of teaching: direct/interative, cooperative learning, inquiry, and conceptual-change. Lessons should contain objectives, teaching procedures, materials, and evaluation procedures.
(20 points)

Peer Teaching Session

Students will teach at least one lesson from their mini-module which will be video-taped and analyzed for effective teaching. Students in class will serve as peer students, and observational-coaches in these peer teaching sessions.
(20 points)

Evaluation and Assessment

During the quarter, students will receive verbal and written feedback and the assignments and exams from instructors and peers. Your overall grade in the course will be based on the following:

Exams (midterm and final).....100 pts
Projects (5 @ 20 pts).....100 pts

Grades will be determine on a percentage basis (90%, 80%, 70% , 60%)of the total points. (e.g. 180-200(A); 160-180(B); 140-160(C); etc.)

PROPOSED SCHEDULE

TOPIC	READING
I. Beliefs about Teaching	Arends - 1
Repertoire of Effective Practice	Henderson -1,2,3
Reflective Teaching	
Reflective Teaching Sessions	
II. Planning for Instruction	
Lesson Planning	Arends - 2-7
Learning Environments and Motivation	Henderson 4
Multicultural and Mainstreamed Classrooms	
Beginning Ideas about Classroom Management	
Assessment and Evaluation	
III. Instructional Strategies and Models of Teaching	Arends 8-12
Direct Instruction	Henderson 5,6
Cooperative Learning	
Discovery and Questioning (inquiry)	
Concept Teaching	
Micro-Teaching Lessons	
IV. Designing and Using Instructional Materials and Aids	Articles
Textbooks and Print Material	Labs
Audiovisual Aids(Overhead, Slides, etc)	Demonstrations
Video Recording (VCR, Videodisks, etc)	
Computers and Multimedia	
Copyright Laws	

V. Micro-Teaching Sessions — Henderson - 7,8
Collaborative Inquiry
Mini-Teaching Modules
Peer Teaching

VI. Reflecting on Teaching and Learning — Arends 13-15
Using the Effective Schools Research — Henderson -9
Improving Classrooms and Schools
Becoming a Student of One's Own Teaching
Personal Log

BIBLIOGRAPHY FOR MSIT 660

ABOUT SECONDARY SCHOOLS

Goodlad, John I. (1984). *A Place Called School.* New York: McGraw Hill.

Sizer, Theodore I. (1992). *Horace's School: Redesigning the American High School.*Boston: Houghton Mifflin.

Fiske, Edward B. (1991). *Smart Schools, Smart Kids: Why Do Some Schools Work.* New York: Simon & Schuster.

ISSUES IN SEONDARY EDUCATION

Borich, Gary D. (1991). *EffectiveTeaching Methods* . Columbus, OH: Merrill.

Bruner, Jerome (1990) *Acts of Meaning.* Cambridge, MA: Harvard University Press.

Cetron, Marvin and Gayle, Margret (1991). *Educational Renaissance: Our Schools at the Turn of the Twenty-First Century.* New York: St. Martin's Press.

Clark, Leonard H. and Starr, Irving S. (1991) *Secondary and Middle School Teaching Methods(6th ed.).* New York : Macmillan.

Curwin, Richard L. and Mendler, Allen N.(1988). *Discipline with Dignity.* Alexandria, VA: Association for Supervision and Curriculum Development.

Davidson, Neil.(1990). *Cooperative Learning in Mathematics.* Menlo Park, CA: Addison-Welsey.

Emmer, Edmund J., et.al.(1989). *Classroom Management for Secondary Teachers.* Englewood Cliffs, NJ: Prentice-Hall.

Hassard, Jack. (1992). *Minds on Science: The Art of Teaching Middle and Seconaary School Science.* New York: Harper Collins.

Hassard, Jack. (1992). *Using Cooperative Learning to Enhance Your Science Instruction.* Bellevue, WA: Bureau of Education and Research.

Joyce, Bruce and Weil, Marsha. (1992). *Models of Teaching* Englewood Cliffs, NJ: Prentice-Hall.

Stor, Ira (1992). *Empowering Education: Critical Teaching for Social Change* . Chicago: The University of Chicago Press.

Diversity

Bull. Barry L., Fruehling, Royal T., and Chattergy, Virgie (1992). *The Ethics of Multicultural and Bilingual Education.* New York: Teachers College Press.

Derman-Sparks, L. (1989). *Anti-Bias Curriculum.* Washington, D. CBul::.: NAEYC.

Kozol, John (1991) *Savage Inequalities.* New York: Harper Collins.

Nieto, Sontia (1992). *Affirming Diversity: The Sociopolitical Context of Multicuitrai Education.* New York : Longman Press.

Richard-Armato, Richand and Marguerite A. Snow (1992). *The Multicultural Classroom.* New York: Longman Press.

Technology

Bitter, Gary G. (1993) *Using a Microcomputer in the Classroom.* Boston: Allyn & Bacon.

U. S. Congress, Office of Technology Assessment (1988) *Power On! New Tools for Teaching and Learning* . Washington, DC: U.S. Government Printing Office.

Cannings, Terence R. and Finkel, LeRoy. (1993) *The Technology Age Classroom* . Wilsonville, OR: Franklin, Beedle & Associates.

Lillie, David L., et.al. (1991). *Computers and Effective Instruction* . New York: Longman Press

Starfield, Anthony M., Smith, Karl A., and Bleloch, Andrew L.(1992) *How to Model It: Problem Solving for the Computer Age.* Palo Alto, CA: Dale Seymour.

Assessment

Archbald, Doug A. and Newman, Fred M. (1988). *Beyond Standardized Testing: Assessing Authentic Academic Achievement in Secondary Schools.* Reston: VA: National Association of Secondary School Principals.

Gronlund, Norman E. (1992). *How to Make Achievement Tests and Assessment , 5th ed.*. Boston: Allyn & Bacon.

Mune, Judy. (1990). *Portfolio Assessment in Mathematics* . Santa Barbara, Calif.: California Mathematics Project.

Stenmark, Jean K. (1989). *Assessment Alternatives in Mathematics* . Berkeley, Calif.: University of California.

Stenmark, Jean K., ed. (1991). *Mathematics Assessments: Myths, Models, Good Questions, and Practical Suggestions* . Reston, VA: National Council of Teachers of Mathematics.

Syllabus
EDSC 655

Methods and Materials for Teaching Science

Catalog Description

EDSC 655 Methods and Materials for Teaching Science (5)

Examines instructional materials, teaching strategies, and evaluation procedures for teaching secondary science.

Co-requisites: Concurrent enrollment in MSIT 660

Textbook: Hassard, Jack (1992). Minds on Science: The Art of Teaching Middle and High School Science. New York: HarperCollins Publishers

Course Objectives

- To develop a rationale for a hands-on/minds-on, inquiry-oriented approach to science.
- To apply recent theories of learning to science teaching.
- To design and field test science lessons in the context of micro-teaching sessions.
- To describe and apply models of teaching including: direct/interactive teaching, inquiry teaching, constructivist teaching, and cooperative learning
- To describe and implement various strategies of teaching such as wait-time, questioning, discussion techniques, and reading techniques.
- To demonstrate microteaching skills in a peer teaching format.
- To explore the uses of microcomputers and other technologies and their impact on learning in the science.
- To describe issues and activities that bring students in touch with science/technology/society issues.

Requirements

Class Participation and Attendance

It is expected that students will attend class regularly. Points will not be awarded for attendance or class participation. However, your ability to achieve the course objectives will be greatly affected if you are absent from class and will affect the quality of your participation in the discussions, activities, opportunities for reflection, and the timeliness of class assignments.

Examinations

A midterm and final exam will be give as scheduled. Students are expected to take the exams on the assigned dates. Any exceptions must be approved, in advance, by the instructor.

Projects/Learning Activities

Think Piece: A "Think Piece" is a verbal or visual analysis or synthesis of some aspect of what you are learning about the science teaching. If you use words, the "Think

Piece" should be limited to two pages (types); if your "Think Piece" is visual, limit yourself to a poster size product. You are required to complete one "Think Piece" and present it to the class. For ideas, please refer to the "Science Teaching Gazette," a section which is located at the end of each chapter of your textbook. Here are some sample "Think Piece" topics:

- Why is inquiry teaching not a common teaching methodology in secondary science?
- What are your reasons for wanting to be a science teacher?
- What are the best qualities of a science teacher?
- What is conceptual change teaching?
- Should values be presented in the science curriculum?
- Do you think science fiction has a place in the science curriculum? Why?

Exciting Examples, Everyday Phenomena (EEEP): This is a grown-up version of show and tell. However, in this version, you are to bring in an example of an EEEP in the form of an object, artifact, machine, photograph, piece of technology and use it to illustrate the teaching of an idea in science. EEEPs help students relate science to every day life. They tend to be application oriented. They spark curiosity. They are fun. They are interesting. Once during the quarter, you will be on stage for about three-to-five minutes to present your EEEP to the class. One a separate sheet of paper describe how your EEEP could be used to teach some aspect of science. Provide a copy for each student in the class, as well as the instructor. EEEPs will also be videotaped. Please refer to your textbook for more information about EEEPs.

Readings: Annotated Bibliography: You should use the readings list to guide your literary work during the quarter. Also consult the list of references at the end of the syllabus to enrich your bibliography. You should prepare an annotated list of what you read. Your list can specify chapters from the textbook, as well as complete book entries, and journal articles. Annotations can be a one or two sentence comment (summary, review, or evaluation).

Microteaching: You should plan and carry out a microteaching lesson using a hands-on/minds-on approach. Content should be appropriate to middle school students, and should be based on current curriculum materials used in the teaching of science. Lessons will be presented to a small group of peers. Lessons should take no longer than ten minutes. They will be video-taped, and you will be involved in a post-lesson observation session with one of your peers. Your lesson plan should be distributed to each member of the class after your presentation. You should also prepare a short critique which focuses on (1) how you would change the lesson if you taught it again, (2) what were the strengths of the lesson, and (3) how the learners reacted to the lesson.

Portfolio: You should maintain a portfolio of your work during the quarter. This should include not only your work in this course, but your work in MSIT 660. The portfolio should contain copies of all the written requirements of your work, including your "Holistic-Reflective Personal Log." The portfolio should be turned in at the end of the quarter for evaluation.

Evaluation and Assessment

During the quarter, students will receive verbal and written feedback about the assignments and exams. Your overall grade in the course will be based on the following:

Examinations (midterm and final)	100 points

Projects (5 @ 20 points) 100 points

Grades will be determined on a percentage basis of the total points, e.g. 90% = A, 80% = B, etc.

Proposed Schedule

Topics	**Readings**
I. Inquiry into Science Teaching	Hassard, Chapter 1 Bronowski Alic
II. How adolescents learn science	Hassard, Chapter 2 Lawson, Abraham, and Renner
III. Philosophy, Goals and Objectives of Science Teaching	Hassard, Chapter 3 Science for All Americans, AAAS
IV. Models of Science Teaching • Inquiry • Direct Teaching	Hassard, Chapter 7 Barman
V. Models of Science Teaching • Constructivism • Cooperative Learning	Hassard, Chapter 7 Osborne and Freberg Johnson, Johnson and Holubec
VI. Strategies Fostering Thinking in the Science Classroom • Interactive Strategies • Reading Strategies • Writing Strategies	Hassard, Chapter 8 Bulman
VII. Designing Science Teaching Lessons	Hassard, Chapter 9 GEMS Curriculum Modules
VIII. Science for All Students • Global Perspective • Multicultural Perspective • Gender Issues	Hassard, Chapter 11 Banks Skolnik, Langbort and Day

Bibliography

Abruscato, Joe and Jack Hassard. *The Whole Cosmos Catalog of Science Activities*. Glenview, Il. Scott, Foreman, 1991

Abruscato, Joseph. Children, Computers, and Science Teaching. Englewood Cliffs, N.J.: Prentice-Hall, 1986

Alic, Margaret. *Hypatia's Heritage: A History of Women in Science from Antiquity through the Ninteenth Century*. Boston: Beacon Press, 1986.

Banks, James A. *Teaching Strategies for Ethnic Studies*. Boston: Allyn and Bacon, 1987.

Barman, Charles R. An Expanded View of the Learning Cycle: New Ideas About an Effective Teaching Strategy. Council for Elementary Science International, Occasional Paper Series, #4, 1989.

Bronowski, J. *Science and Human Values*. New York: Harper and Row, 1956.

Bybee, Rodger, Janet Carlson, and Alan McCormack. *Redesigning Science and Technology Education*. Washington, D.C.: NSTA, 1984

Bulman, Lesley. *Teaching Language and Study Skills in Secondary Science*. London: Heinemann, 1985.

Dunn, Rita and Kenneth Dunn. *Teaching Students Through Their Individual Learning Styles: a Practical Approach*. Reston, VA: Reston Publishing Co. 1978.

Focus on Excellence Series. Washington, D.C. NSTA:

- *Science as Inquiry*, John Penick, ed. 1983
- *Biology*, John Penick and Ronald Bonnstetter, eds., 1983
- *Physics*, John Penick, ed. 1984
- *Middle School/Junior High Science*, John Penick and Joseph Krajcik, eds. 1985
- *Physical Science*, John Penick and Vincent Lunetta, eds., 1984
- *Science/Technology/Society*, John Penick, Richard Meinhard-Pellens, eds., 1984
- *Chemistry*, John Penick and Joseph Krajcik, eds., 1985
- *Earth Science*, John Penick, ed., 1985

Fraser, Sherry, Project Director. *SPACES: Solving Problems of Access to Careers in Engineering and Science*. Palo Alto, CA: Dale Seymour Publications, 1982.

Funk, H. James, et.al. *Learning Science Process Skills*. Dubuque, IO: Kendall/Hunt, 1979.

GEMS (Great Explorations in Math and Science) Units, Berkeley: Lawrence Hall of Science

- Animals in Action
- Chemical Reactions
- Discovering Density
- Magnifiers
- Mapping Animal Movements
- Paper Towel Testing
- Quadice

Hassard, Jack. *Adventures in Geology*. Alexandria, VA: American Geological Institute.1989.

Hassard, Jack. *Science Experiences: Cooperative Learning and TheTeaching of Science*. Menlo Park, CA: Addison-Wesley, 1990.*

Hoffman, Helenmarie H. and Kenneth S. Ricker. *Science Education and the Physically Handicapped*. Washinton, NSTA, 1979.

Johnson, David, Roger Johnson, and Edythe Johnson Holubec, *Circles of Learning*. Alexandria, VA: Association for Supervision and Curriculum Development, 1991.

Judson, Horace Freeland. *The Search for Solutions*. New York: Holt, Rinehart and Winston, 1980.

Kagan, Spencer, *Cooperative Learning: Resources for Teachers*. San Juan Capistrano, CA: Resources for Teachers, 1991 (27128 Paseo Espada, Suite 602, 92675

Lawrence Hall of Science, *To Build a House: GEMS & the Thematic Approach to Science Teaching*, Berkeley, CA: Lawrence Hall, 1991.

Lawson, Anton, Michael Abraham, and John Renner, A *Theory of Instruction: Using the Learning Cycle to Teach Science Concepts and Thinking Skills*, National Association for Research in Science Teaching, 1989.

Making Sense of the Future: A Position Paper on the role of Technology in Science, Mathematics, and Computing Education. Cambridge, MA. Harvard Educational Technology Center, 1988

Mallow, Jeffry V. *Science Anxiety: Fear of Science and How to Overcome It*. New York: Thomond Press, 1981.

Morrison, Philip and Phylis. *The Ring of Truth: An Inquiry into How We Know What We Know*. New York: Random House, 1987.

NOVA: Adventures in Science. WGBH Boston. Reading, MA: Addison-Wesley, 1983.

Osborne, Roger and Peter Freyberg. *Learning in Science*. Auckland: Heinemann, 1985

Padilla, Michael J. *Science and the Early Adolescent*. Washinton, D.C. NSTA, 1983.

Papert, Seymour, *Mindstorms: Children, Computers, and Powerful Ideas*. New York: Basic Books, 1980.

Peterson, Rita, et.al. *Science and Society: A Sourcebook for Elementary and Junior High School Teachers*. Columbus, OH: Charles Merrill Publishing Company, 1984.

Project 2061: Science for All Americans, Washington, DC: American Association for the Advancement of Science, 1989. Write to AAAS 1333 H Street, NW, Washington, DC 20005 to receive free copies of the newsletter: *2061 Today*.

Rogers, Carl. *Freedom to Learn for the 1980s*. Columbus, OH: Merril, 1983.

Romey, William D. *Teaching the Gifted and Talented in the Science Classroom*. Washington, D.C. NEA, 1988.

Samples, Bob, Bill Hammond and Bernice McCarthy. *4MAT and Science: Toward Wholeness in Science Education*. Barrington, IL: Excel, Inc. 1985

Science Fair Projects, K-8. Washington: NSTA, 1988.

Science Fair Projects, 7-12. Washington: NSTA, 1988

Scope, Sequence & Coordination, National Science Teachers Association, 1742 Connecticut Avenue, NW, Washington, DC 20009. Write to NSTA to receive the SS&C newsletter, *Currents*.

Showalter, Victor M. *Conditions for Good Science Teaching*. Washinton, D.C. NSTA, 1984.

Skolnik, Joan, Carol Langbort, and Lucille Day. *How to Encourage Girls in Math & Science*. Engelwood Cliffs, NJ: Prentice-Hall, Inc. 1984.

Stronck, David R. *Discussing Sex in the Classroom: Readings for Teachers*. Washington: NSTA, 1982.

Strongin, Herb. *Science on a Shoestring*. Menlo Park, CA: Addison-Wesley Publishing,1992

Sutman, Francis X, Virginia French Allen, and Francis Shoemaker. *Learning English Through Science*. Washinton: NSTA, 1986.

Tobin, Kenneth, Jane Butler Kahle, and Barry J. Frasher. *Windows into Science Classrooms*. London: The Falmer Press, 1990

Journals:

American Biology Teacher
Journal of Earth Science Teaching
Journal of Chemical Education
Journal of Research in Science Teaching
School Science and Mathematics
Science and Children
Science Education
The Physics Teacher
The Science Teacher

\COURSE SYLLABUS\
EDMT 656
METHODS AND MATERIALS FOR
TEACHING SECONDARY MATHEMATICS

Catalog Description:

Examines instructional materials, teaching strategies, and evaluation procedures for teaching secondary school mathematics.

Required Textbooks:

Cangelosi, James S. (1991) *Teaching Mathematics in Secondary and Middle School.* Merrill Publishing Company.

Course Overview:

This course is designed to provide a study of methods, materials, and strategies for teaching secondary school mathematics. The primary focus of this course will be on developing strategies for teaching fundamental concepts and skills of mathematics taught in secondary schools. The course will also provide a study of such topics as lesson planning, classroom management, evaluation, testing, grading, and other important aspects related to effective mathematics instruction.

Organization of the Course:

Your instructor firmly believes that a student learns by doing, by participating, and by reflecting on what has been done or said. Therefore, participation is essential to success in completing the objectives of this course. The nature of each topic and the constraints of time will bear on how the instruction is organized. For certain topics a well constructed lecture/demonstration maybe the most effective means of instruction. For other topics-especially those where the teaching process is involved-it is important to foster actual involvement on the part of the learner(you).

A variety of instructional techniques and media will be illustrated and used as on integral part of this course. Calculators and computers will receive particular attention as instructional and problem solving tools.

Grading Procedures:

Your grade in this course will be based on the following:

Laboratory Assignments..5 @20 pts.....100 pts
Projects (Microteaching and Portfolio).. 2 @100 pts....100 pts
Exams (Mid Term and Final).....200 pts

Your grade will be based on the total points (TP) earned in the course.
(TP>360 A, 360< TP < 320 B; 320< TP < 280 C, etc.)
Please feel free to consider me at your disposal during the course. I would like nothing more than to encourage you to learn more about teaching mathematics. I have a good collection of mathematics education materials in my office and I am very familiar with the holdings of the Instructional Resource Center and the Library. I will be most happy to discuss the assignments or readings with you.

Bibliography

Banks, James A. 1988. *Multiethnic Education* 2d ed. Boston: Allyn and Bacon.

Courant, R., and H. Robbins. 1958 *What is Mathematics?* New York: Oxford University

Davison, N., ed. 1990. *Cooperative Learning in Mathematics.* Menlo Park, CA: Addison-Welsey.

Gardner, Howard. 1983 *Frames of Mind.* New York: Basic Books.

NCTM 1989. *Curriculum and Evaluation Standards* . Reston, VA: NCTM.

_____ 1991. *Professional Standards for Teaching Mathematics* . Reston, VA: NCTM.

National Research Council. 1989. *Everybody Counts: A Report to the Nation on the Future of Mathematics Education.* Washington, D. C. : National Academy Press.

Posamentier, A. S., and J. Stepelman. 1992. *Teaching Secondary School Mathematics.* Columbus, OH: Macmillan.

Sawyer, W. W. 1955. *A Prelude to Mathematics.* Baltimore: Penguin.

Steen, L. A. 1989. "Teaching Mathematics for Tommorrow's World" *Educational Leadership* 4: 18-23.

Stenmark, J. K. 1989. *Assessment Alternatives in Mathematics* . Berkely, CA: EQUALS, University of Califorina.

Willoughby, S. S. 1990. *Mathematics Education for a Changing World.* Alexandria, VA: Association for Curriculum Supervison and Development.

Journals

A comprehensive list of journal articles will be provided on a wide variety of topics related to teaching secondary school mathematics. Articles will be selected from *Arithmetics Teacher, Mathematics Teacher, School Mathematics and Science, Electronic Learning, Mathematics and Computer Education, Computer Teacher, and the Journal of Research in Mathematics Education.*

TENTATIVE SCHEDULE

DATE TOPICS

Unit #1: Teaching Mathematics: An Overview

-The Nature of Mathematics Teaching
-The Teaching Process-An Overview
-The Mathematics Curriculum (NCTM *Standards*)

Readings: Chapter 1, 2, Appendix D

Unit #2: Inside the Mathematics Classroom

-Effective Teaching and Learning of Mathematics
-The Learner and Environments for Learning
-Learning and Communicating Mathematics
- Lesson Planning

Readings: Chapters 3, 4

Unit #3: Strategies for Teaching Mathematics

-Styles of Teaching
-Choices for Promoting Learning
-Some Teaching Approaches
-Making Your Own Choices

Readings: Chapters 5,6

Unit #4: Teaching Middle Grade Mathematics: The Content and Methods
-Teaching Important Ideas in Middle Grade Mathematics (Grades 5-8)
-Number Sense and Numeration
-Computation and Estimation
-Patterns, Functions, and Pre-Algebra
-Probability, Statistics, and Data Analysis
-Geometry and Measurement

Readings: Articles

Unit # 5: Teaching Mathematics (Grades 8-10): The Content and Methods
- Beginning Algebra & Geometry
-Functions, Probability, Statistics, & Data Analysis
Readings: Articles

Unit # 6: Materials, Media, and Technology
-Textbooks and Supplemental Instructional Materials
-Media and Models
-Calculators and Computers
Readings: Articles
Mid-Term Exam

Field Experiences in Selected Secondary

Unit #8: Mathematics Assessment
-Types of Assessment
-Alternative Assessment Techniques
Readings: Chapter 7

Unit # 7: Outside the Classroom
-Other Teaching Responsibilities
-Extra Curricula Activities(Math Clubs, Competitions, etc.)
-Professional Development
Readings: Articles

Looking Ahead
-Student Teaching and Job Selection
-First Year Teaching
Readings: Chapters 8,9

Final Exam
Please note that this schedule is tentative and changes may be necessary because of the scheduling of the field experiences, or other factors.

10

Appendix

Application: Alternative Certification Institute

June 19 - August 4, 1989

Complete and mail to address shown below, Check: Intern____Mentor_____ no later than May 1, 1989.

Name_____Social Security_____
Home address_____
_____
Telephone: Home_____Work_____
School_____School System_____
School Address_____

If you are an intern, please complete items 1 - 5; if you are a mentor, please complete items 6 - 11.

Interns

1. What is you subject specialization? ____Foreign Language (languages:)_____Mathematics _____Science (Area:)
2. List the education courses you have taken:
3. What teaching experience have you had? If you are currently teaching, please tell what you teach and the grade levels.
4. Are you currently a GSU student? ____If not, you must apply to GSU by May 10, 1989. Please call 651-2539 for an a GSU application. You should apply as a post-baccalaureate student.
5. Name of your mentor teacher (if currently teaching)_____

Mentor

6. What is your subject specialization? ____Foreign Language (languages:)_____Mathematics _____Science (Area:)
7. What teaching credential do you hold?_____
8. Have you taken any course work in the supervision of student teachers? If so, please list the courses you have had.
9. Have you supervised student teachers or interns before? How many and when?
10. Are you currently a GSU student?_____ You must apply by May 10, 1989 as a non-degree or degree graduate student. To apply call 651-2539.
11. Name of your intern teacher_____

_____ _____
Signature Date

Dr. Jack Hassard
Alternative Certification Institute
Georgia State University
Department of Curriculum and Instruction
University Plaza
Atlanta, GA 30303
(404)651-2518

348

Summer Quarter 1989
June 19 - August 4

Alternative Certification Institute for Secondary Foreign Language, Mathematics, and Science Teachers

An Intern-Mentor Training Program

Georgia State University

Becoming a Secondary Foreign Language, Mathematics or Science Teacher: A Summer Institute

Goals of the Institute

Through a grant from the Georgia Department of Education, the Department of Curriculum and Instruction, in conjunction with Department of Special Education and the Department of Educational Foundations, will offer an alternative teacher preparation institute and academic year internship (with the cooperation of local school systems) for 24 secondary foreign language, mathematics and science teachers. The goal of the institute, and academic year internship is to provide a practical approach to the training of beginning secondary teachers that is experiential, and based on the most current pedagogical research-based knowledge on teacher preparation. The program will include intern and mentor training. Interns will complete 20 hours of coursework during the summer institute in (a) human growth and development, (b) curriculum, (c) teaching methodology and (d) exceptional children and youth. Interns will participate in a year-long internship under the supervision of a mentor teacher. Mentors will receive five hours of coursework and training during the summer on mentoring and supervision, and participate in a five hour practicum during the academic year. Interns and mentors will participate in a series of seminars on teaching at GSU during the 1989-1990 academic year.

Who may apply?

- Any secondary foreign language, mathematics or science teacher seeking initial certification in these fields, and who is currently employed or will be employed in a metro-Atlanta school system.
- Individuals not employed as a teacher, but holding a bachelor's degree from a regionally accredited college (with a degree major in foreign language, mathematics or science) who are actively seeking certification may also apply.

Eligibility

Interns:

1. Hold a bachelor's degree from a regionally accredited college or university with a degree major and coursework that will satisfy subject matter requirements for certification in foreign language, mathematics and science.
2. Have an overall grade point average of 2.5 on a 4.0 scale for coursework in the baccalaureate degree.
3. Be available from June 19 - August 4, 1989 to attend the summer institute at GSU, and be willing to participate in the residential portion of the institute to be held at North Georgia College (July 23 - 28, 1989).
4. Be admitted to GSU as a post baccalaureate student, and be admitted to teacher education in the College of Education. The criteria for admission to teacher education include criteria 1 and 2 above plus successful completion of the English core, and demonstrated competence in oral communication. Call (404)651-2539 for an application to GSU and information about admission to teacher education. The deadline for admission to GSU for summer quarter is May 10, 1989.
5. Participate in a year long internship directed by the school system and under the supervision of a mentor. Although the institute does not have funds to pay for college credit, internship credit will be made available (at the interns' or school systems' expense).

Mentors:

Mentors must be in the same certified field and in the same school as the intern, hold at least a T-4 or PBT-4 in the certified field, and have had at least one year of experience in the participating school system. Mentors must be available July 17-21 to attend the summer training at GSU, and July 23-28 for a residential training retreat to be held at North Georgia College. They must participate as mentors during the 1989-90 academic year. Mentors should be admitted to GSU as either a non-degree or degree student to enroll in the two supervision courses. Finally, the mentor should be a skilled practitioner, able to model exemplary practice, work well with beginning teachers, and be recognized by peers for outstanding teaching qualities.

The Program

•The Summer Institute for Interns

Interns will participate in a holistic curriculum based on three-themes—pedagogy, the nature of the students and the process of teaching. Throughout the summer (daily from 8:30 a.m - 4:30 p.m.) interns will be engaged in activities including micro-teaching, reflective teaching and peer teaching, designed to facilitate the integration of content from methods, curriculum, special education, and human growth and development. Interns will earn 5 hours of college credit in each of the following courses (20 hours total): (1) EDCI 452. Curriculum for Secondary Education, (2)EDMT 456. Methods and Materials of Mathematics for Secondary Education or EDSC 457. Methods and Materials of Science for Secondary Education or EDCI 460. Methods and Materials for Teaching in Secondary Education (Foreign Language), (3) FED 305. Human Growth and Development, and (4) EXC 401. Exceptional Children and Youth.

The four courses will be integrated into a holistic schedule from June 19 - August 4, 1989. with a residential training retreat to be held at North Georgia College July 23 - 28, 1989.

•The Summer Institute for Mentors

Mentors will participate in specialized training on mentoring and supervision July17 -21 at GSU daily from 8:30 a.m. to 4:30 p.m. Mentors will also participate in the residential training retreat at North Georgia College, July 23 - 28. Mentors will earn 5 hours of graduate credit for the summer training (EDCI 767. Supervision of Student Teachers), and will earn 5 hours of graduate credit during the internship period (academic year 1989-1990) (EDCI 768. Practicum in Supervision of Student Teachers).

•The Academic Year Internship

Interns will be enrolled either in a school system internship program, or a series of internship courses (fees paid by intern or school system) at GSU during the academic year 1989-1990. Fifteen hours of credit will be awarded for successful completion of the internship program. All interns and mentors will be involved in a series of seminars during the academic year at GSU.

Tuition Costs and Honorariums

For the interns, the institute will pay the costs of tuition for the summer institute (20 hours of college credit), books and materials, as well as travel expenses, food and lodging during the five-day retreat at North Georgia College.

For the mentors, the institute will award an honorarium and funds for released time totaling $2,500 for participation in the summer institute, and for the supervision of the intern during the academic year. Tuition (for 10 hours credit), cost of books and travel, as well as board and room expenses at the residential retreat at North Georgia College will also be paid.

Institute Staff

Director:

Jack Hassard, Ph.D., Professor, Department of Curriculum and Instruction, GSU

Coordinators:

Parker Blount, Ph.D., Associate Professor, Educational Foundations, GSU
Edith Guyton, Ph.D., Director, Educational Field Experiences, GSU
Hiram Johnston, Ph.D., Professor, Department of Curriculum and Instruction, GSU
Melvin Kaufman, Ph.D., Professor, Department of Special Education, GSU
Kim Kendall, M.S., Instructor, Southwest DeKalb High School

For further information, call Dr. Jack Hassard at (404) 651-2518

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ALTERNATIVE TEACHER PREPARATION INSTITUTE FOR SECONDARY FOREIGN LANGUAGE, MATHEMATICS AND SCIENCE TEACHERS

June 19 - August 2, 1990
Georgia State University

Goals of the Institute:

Through a grant from the Georgia Department of Education, the Department of Curriculum and Instruction, in conjunction with the Department of Educational Foundations, will offer an alternative teacher preparation institute and academic year internship (with the cooperation of local school systems) for 24 secondary foreign language, mathematics and science teachers. The goal of the institute, and academic year internship is to provide a practical approach to the training of beginning secondary teachers that is experiential, and based on the most current pedagogical research-based knowledge on teacher preparation. The program will include intern and mentor training. Interns will complete 15 hours of coursework during the summer institute in (a) human growth and development, (b) clincial teaching and (c) teaching methodology. Interns will participate in a year-long internship under the supervision of a mentor teacher. Mentors will receive training during the summer on mentoring and supervision. Interns and mentors will participate in a series of seminars on teaching at GSU during the 1990-91 academic year.

Who May Apply?

Any secondary foreign language, mathematics or science teacher seeking initial certification in these fields, and who is currently employed or will be employed in a metro-Atlanta school system.

Individuals not employed as a teacher, but holding a bachelor's degree from a regionally accredited college (with a degree major in foreign language, mathematics or science) who are actively seeking certification may also apply.

Eligibility:

1. Hold a bachelor's degree from a regionally accredited college or university with a degree major coursework that will satisfy subject matter requirements for certification in foreign language, mathematics and science.

2. Have an overall grade point average of 2.5 on a 4.0 scale for coursework in the baccalaureate degree.

3. Be available from June 19 - August 2, 1990 to attend the summer institute at GSU, and be willing to participate in the residential portion of the institute to be held in North Georgia (July 22-26, 1990).

4. Be admitted to GSU as a post-baccalaureate student, and be admitted to teacher education in the College of Education. The criteria for admission to teacher education include criteria 1 and 2 above plus successful completion of the English core, and demonstrated competence in oral communication. Call (404) 651-2539 for an application to GSU and information about admission to teacher education. The deadline for admission to GSU for summer quarter is May 10, 1990.

5. Participate in a year long internship directed by the school system and under the supervision of a mentor. Although the institute does not have funds to pay for college credit, internship credit will be made available (at the interns' or school systems' expense).

Mentors:

Mentors must be in the same certified field and in the same school as the intern, hold at least a T-4 or PBT-4 in the certified field, and have had at least one year of experience in the participating school system. Mentors must be available July 19-20 to attend the summer training at GSU, and July 22-26 for a residential training retreat to be held in North Georgia. They must participate as mentors during the 1990-91 academic year.

The Program: The Summer Institute for Interns

Interns will participate in a holistic curriculum based on three themes - pedagogy, the nature of the learners and the process of teaching. Throughout the summer (Monday-Thursday from 8:30 a.m. -4:30 p.m.) interns will be engaged in laboratory activities including micro-teaching, reflective teaching and peer teaching designed to facilitate the integration of pedagogical content. Interns will earn 5 hours of college credit in each of the following courses (15 hours total): (1) EDCI 450 Clinical Teaching, (2) EDMT 456 Methods and Materials of Mathematics for Secondary Education or EDSC 457 Methods and Materials of Science for Secondary Education or EDCI 481 Directed Readings: Methods and Materials

for Teaching in Secondary Education (Foreign Language), and (3) FED 305 Human Growth and Development.

The three courses will be integrated into a holistic schedule from June 19 - July 29, 1990 with a residential training retreat to be held in North Georgia July 22-26, 1990. During July 30-August 2, interns will meet with mentors to prepare for the opening of school.

NOTE: The exceptional children and youth (Special Education) course, which is required of all teachers, will not be offered as part of the Institute. Interns will be able to take a staff development course in the school district to meet this requirement.

The Summer Institute for Mentors:

Mentors will participate in specialized training on mentoring and supervision July 19-20 at GSU from 8:30 a.m. to 4:30 p.m. Mentors will also participate in the residential training retreat in North Georgia, July 22-26.

The Academic Year Internship:

Interns will be enrolled either in a school system internship program, or a series of internship courses (fees paid by intern or school system) at GSU during the academic year 1990-91. Fifteen hours of credit will be awarded for successful completion of the internship program. All interns and mentors will be involved in a series of seminars during the academic year at GSU.

Tuition Costs and Honorariums:

For the interns, the institute will pay the costs of tuition for the summer institute (15 hours of college credit), books and materials, as well as travel expenses, food and lodging during the four-day retreat in North Georgia. For the mentors, the institute will award an honorarium of $1,500 for participation in the summer institute, and for the supervision of the intern during the academic year. Cost of training, books and travel, as well as board and room expenses at the residential retreat in North Georgia will also be paid.

Institute Staff:

Director:

Jack Hassard, Ph.D., Professor, Department of Curriculum and Instruction, GSU

Coordinators:

Parker Blount, Ph.D., Associate Professor, Educational Foundations, GSU
Edith Guyton, Ph.D., Assistant Professor, Early Childhood Education, GSU
Hiram Johnston, Ph.D., Professor, Department of Curriculum and Instruction, GSU
Kim Kendall, M.S., Foreign Language Teacher, Southwest DeKalb High School, DeKalb County Schools

How to Apply:

Complete the attached application, or call Dr. Jack Hassard (404) 651-2518 and request an application. Deadline for application is May 7, 1990.

Georgia State University, a unit of the University System of Georgia, is an equal opportunity / affirmative action institution.

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ALTERNATIVE TEACHER PREPARATION INSTITUTE
Georgia State University

1990-91

APPLICATION

Please complete all items on this form.

SECTION I. Personal Data

Name _____ Social Security # _____

Address _____ City _____ State _____ Zip _____

Phones: (HOME) _____ (WORK) _____

School (where you teach) _____ County _____

Address _____ City _____ State _____

Subjects you teach _____ Grade Level _____

SECTION II. Educational Background

Colleges/Universities Attended:

COLLEGE	YEARS ATTENDED	DEGREE	MAJOR	MINOR

SECTION III. Certification Information

1. Have you taken and passed the Teacher Certification Test in your teaching field?

   Yes _____ No _____ Date _____

2. Have you received a teacher certification evaluational letter from the Georgia Department of Education?

   Yes _____ No _____

   NOTE: **You must submit a copy of this letter with this application to the Institute. If you have applied for but not received an evaluation, indicate the date you applied** _____.

SECTION IV. Questions

Please respond briefly on a separate sheet of paper to the following questions:

1. Why did you decide to become a teacher?
2. Why do you want to teach high school students?
3. What do you think are the qualities of a good high school teacher?
4. What experiences do you think will help you be a good high school teacher?
5. Do you think all students are capable of learning? Why?

PLEASE RETURN THE APPLICATION MATERIALS BY MAY 7, 1990 TO:

Dr. Jack Hassard
Department of Curriculum and Instruction
Georgia State University
Atlanta, GA 30303

Application materials **must** include the following to be considered for the institute:

1. Completed application and answers to Questions 1-5 in Section IV.
2. Copies of transcripts of all colleges attended.
3. Copy of your certification evaluation letter from the Georgia Department of Education.

NOTE: Acceptance to the institute is subject to your admission as a post-baccalaurate student at G.S.U., and admission to the Teacher Education Program in the College of Education. You can obtain admission materials from the Admissions Office, 102 Sparks Hall, 651-2365. Information about the Teacher Education Program can be obtained from the Office of Academic Assistance, College of Education, 715 Urban Life Building, 651-2539. Also, all applicants will be interviewed during the week of May 14, 1990. You will be notified about the date, time and location after your application is received.

SECTION V. If you are currently teaching, you must return you application with the name of your mentor teacher.

Name of Mentor _____ Social Security # _____

Address _____ City _____ State _____

Phones: (HOME) _____ (WORK) _____

Subject(s) _____ Certification Level _____

School (where mentor teaches) _____ County _____

Address _____ City _____ State _____

Interview Form
Alternative Teacher Preparation Institute
1989

Name_____ Subject Area_____
Interviewer_____ Date_____

Interview Questions:

1. Why did you apply for this institute?

2. Knowing that we can only accept eight candidates in your subject area, what are your plans if you are not accepted as one of candidates?

3. What do you think about the problems facing high school students today?

4. What do you want to tell us about yourself?

Overall Evaluation

1. Keeping in mind that we can only invite 6 in foreign language, 7 in mathematics and 3 in science, what is your overall assessment of this applicant on a scale of 1 - 10 (10 high)

1 2 3 4 5 6 7 8 9 10

2. In your opinion:
   a. we should definitely accept this candidate
   b. we should consider this candidate highly
   c. this candidate is average
   d. we should not accept this candidate

3. Comments and opinions:

ALTERNATIVE TEACHER PREPARATION INSTITUTION

PROGRAM EVALUATION

1990

1. Looking back over the entire program, in general how satisfied were you as a learner?

_____ very satisfied

_____ satisfied

_____ unsatisfied

_____ very dissatisfied

2. Looking back over the program:

a. Which overall presentations were most effective? Why?

b. Which specific activities were most effective? Why?

c. Of all the experiences that you had, which do you think will help you most in your teaching?

3. To increase the satisfaction of participants in future programs:

   a. What changes should we propose in the final report being prepared?

   b. Which topics should be given more emphasis?

   c. Which topics should be give less emphasis?

4. What were your reasons for entering the teaching profession? In column one, select the most important reason for entering the teaching profession. In column two, rank the reasons from most important (1) to least important (13) by placing a number next to each item.

Reasons	Column 1 Most Important Reasons	Column 2 Rank Order
Interest in subject-matter field		
Abilities are well-suited to teaching		
Good salary		
Opportunity to work with young people		
Provides added income		
Current high demand in this field		
Encouragement from others I respect		
Contributes to betterment of society		
Good working hours		
Good vacation time		
Job security		
Provides opportunity to be creative		
Provides a change from my past work		

5. What were you doing prior to enter the summer institute?

Full-time student _____
Part-time student, working part time _____
Fully employed
- Managerial/Professional
  - Manager/administrator _____
  - Engineer _____
  - Mathematician/Scientist _____
  - Social worker/counselor _____
  - Health field worker _____
  - Postsecondary teacher _____
  - Other _____
- Service Occupation _____
- Production, craft, or repair occupation _____
- Armed forces _____

Unemployed _____

6. In what kind of school will you be teaching this fall?

High school _____
Junior high _____
Middle school _____
Do not know _____

7. Male _____ Female _____

8. Subject you teach:

_____ Foreign language _____ Mathematics _____ Science

TO: Dr. Jack Hassard
Director
Alternative Teacher Preparation Institute
Georgia State University
Atlanta, GA 30303

RE: Acceptance Letter

I accept the invitation to participate as an intern in all aspects of the Alternative Certification Institute at Georgia State University, June 19-August 4, 1989, and to participate in the intern/mentoring program during the academic year 1989-1990. My mentor agrees to participate in the program, and will be available for summer training July 17-21 (at GSU) and July 23-28 (at North Georgia College). My principal also is aware of the program, and supports my participation.

_____ _____
Intern Signature Date

_____ _____
Mentor Signature Date

_____ _____
Principal Signature Date

Please Complete:

Intern Home Address

Name_____

Address_____

City_____

Zip_____

Phone_____

Mentor Home Address:

Name_____

Address_____

City_____

Zip_____

Phone_____

Name of School_____ County_____

Address_____

City_____ Zip_____

Phone_____

360